



# COAL AGE



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## Some Problems Worth Discussing

ON page 260, in this issue of *Coal Age*, there appears an article by Samuel Dean that deals with the methods of working a 3-ft. seam of coal. The paper was read at the January meeting of the Rocky Mountain Coal Mining Institute in Denver and absorbed most of the time and attention of the members present. The comments bearing on the paper were so numerous and so divergent in character, that it was suggested the entire matter be presented by *Coal Age* to the industry as a whole, in the hope that new ideas would be submitted by practical coal men in other fields. Therefore, in publishing Mr. Dean's paper, we earnestly invite discussion by all our readers of the following points:

1. Assuming the seam is 3 ft. thick, with a fairly hard floor, and that 12 in. of draw-slate above the coal comes down easily, what should be the track gage and car capacity where the pitch is 10, 15 and 20 deg., respectively?
2. The same as question 1, but assuming that the immediate roof is hard sandstone, and that the floor can be brushed with the aid of blasting.
3. Describe the kind or type of coal-cutting machine that would be preferable in this mine, explaining precautions necessary to prevent explosions of gas.
4. State if you consider it possible or probable that gas may be ignited through the action of the cutter bits.
5. Have you ever known gas to be ignited by a spark or sparks from a miner's pick coming in contact with a sulphur ball or other hard substance?
6. Describe the methods of haulage that you prefer from the coal face to the shaft.
7. Would you work this seam room-and-pillar or longwall?
8. If you believe room-and-pillar is preferable in America, state the reason why, and describe briefly your proposed layout of the workings.
9. What is your opinion of longwall mining with face conveyors?
10. Give a sketch of the type of car you would use.

THE above questions are not the only ones that may arise in the reader's mind. Any other points that seem pertinent to the subject are open for debate. Thick seams are being worked out rapidly in many fields. More companies than ever before are mining in thin coal. Let us get plenty of light on the subject. Don't wait until next week. The letters will come fast and thick. Only a limited number can be published. Get your ideas on paper now and send them to us today.

## Ideas and Suggestions

### An Exodus Without a Canaan—But Not Without Its Lessons

BY SOUTHERNER

For six months or more the coal-mining regions of the South, more particularly the Birmingham district in Alabama, have experienced a steady diminution of negro miners—a class comprising more than 50 per cent. of the mine workers in this district. At first it was generally believed that this applied, as nearly always heretofore, to the least capable and most improvident class of negro labor, and no great attention was paid to it.

At that time many of the mines were not running regularly, and the movement was believed to be nothing more than the usual practice of ignorant negroes desirous of change and lured by promises of more pay, free transportation and all that kind of thing. But the migration continued until in recent months it has assumed the proportions of an exodus. Stranger still—and herein lies the seriousness of the movement to Southern operators—the negroes continue to leave, notwithstanding the fact that wages have been increased and operations are as regular as car supply will permit.

It is difficult for Southern mine managers to believe that any great number of negroes, especially the better element (married men and good wage earners), will leave the South to make new homes in West Virginia or Ohio or other states. Before the presidential election some credence was given to the opinion expressed in the press of the South that the negroes were being taken North to vote; but since the exodus goes on the same after as before the election, this assertion has apparently been proved groundless.

Whether the present exodus of the Southern negro to Northern coal fields will continue or grow beyond present proportions cannot at present be foretold; but there are some salient factors connected with the movement that all parties concerned should consider carefully.

First: It is an exodus without a Canaan! The Southern negro who is leaving the country of his birth and the region to which by every racial and natural tendency he is adapted will not find a "promised land" in the Northern coal fields. There will not be in his new habitat the broad friendliness of spirit that the Southern-born white man has for him, nor will his new "buddies" of foreign birth strike his fancy. There will be no more milk and honey in his new home than there is in Alabama and not nearly so much warmth and sunshine, which is even dearer to the Southern negro than "store checks" and biweekly paydays.

Those who have already come back testify that there is no Canaan for the negro in the Northern coal fields. This will diminish the exodus more than all the advice by friends of their own and the white race.

Second: Thinking mine managers in the South must seriously consider the reasons for such a continued exodus

of negro workmen. Those who have not already done so should begin now. Evidently this is a deeper movement than any former one. The intelligent negro has been told over and over again by his white friends that his best home is in the South. Why then is he leaving by the trainload?

It may be that the negro after all has been too long treated as a "nigger." (To the uninitiated it may be said that there is a wonderful difference in this distinction). Maybe the negro is learning as he becomes more intelligent to dislike a country where he is too often made the goat. By this is meant the operations of an intolerant fee system, too frequent arrests for petty infractions of law—from which the white man is practically immune—and similar wrongs. Has this anything to do with the present exodus?

This is for Southern mining men to find out. Certainly it hardly seems possible that the negro will really forsake the South if he is treated altogether fairly.

For the Northern mine operator who is paying the negro to come and work for him there will be much to learn. He will probably find that the Southern-born negro is, for him, a poor class of labor to recruit. The chance in favor of his retaining for long any great number of his new miners is small. The snows of winter will cause nearly every negro to think with longing of his home in Alabama. And the Northern mine manager will likely get this lesson from his experience—that a negro is, much as the old plantation melody has it, "contrary as a mule." In other words, the black man requires careful handling even when he seems best natured. The Northern operator may learn, too, that in the long run it will not pay to go so far from home for labor.

As for the negro himself, we are sure the lessons he will learn from his wanderings will result in proving to him that contentment will generally be found in the land of one's birth and among one's own people.

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### Extraction of Coal in Breakthroughs

BY AN ASSISTANT

This article should be of particular value to firebosses and assistant foremen, or those whose duty it is to look after the extraction of coal in bituminous mines. No doubt every mine official has had, or will have, his troubles with this problem. The solution here offered will be of value to those whose duty it is to see that the proper breakthroughs required by law are cut through the ribs.

Many of the rooms in the bituminous region are turned on 39-ft. centers and driven 24 ft. wide, leaving a 15-ft. rib between rooms. Now when it comes to cutting on the ribs for breakthroughs, it is found that two cuts with the ordinary breast machine, which cuts about 6 ft. 4 in., will often fail to cut through the rib. It is then necessary for the assistant or fireboss to see that the remaining coal is got out of this passage. There may be from 1 to 4 ft. or more of coal remaining in the breakthrough, and to get this cut and loaded out necessitates paying the machine men

something extra for the third cut, as the small amount of coal will not repay them for their labor. This also means additional expense for yardage, and the men do not want to be bothered with this third cut.

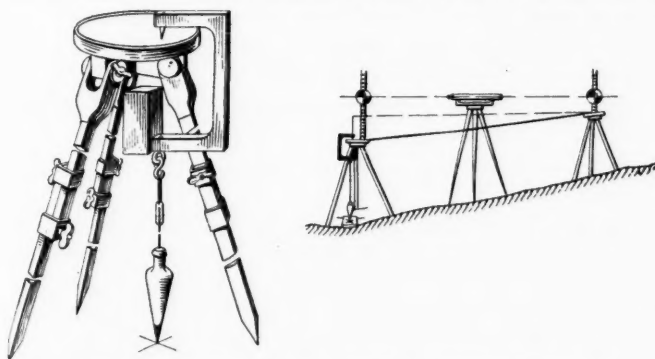
All this can be avoided by the man in charge having the machine men widen the room out to eight runs at the point where the breakthrough is to be made, which will mean two cuts of eight runs each, making the room about 28 ft. wide at this point. This will not seriously injure the uniformity of the rib and will prove to be a decided advantage to the miner, the cutter and the man in charge. It will also result in a saving to the company, as in the vast majority of cases the breakthrough will only have to be cut twice to put it through.

Another suggestion is this: When a room is finishing on the face and the rib is to be drawn immediately, or soon, instead of waiting until the room is driven up its full distance before cutting the rib four runs could be cut on it when the room is within 12 ft. of being finished. After the room is up to the line, the other four runs may be cut. This will save the miner the extra work of keeping his slate back in order to give clearance for the machine and also avoid the necessity of changing the posts. This is particularly advantageous where the roof conditions are bad.

The foregoing suggestions are not trifles. On the contrary they are of much importance, as they save in labor, trouble and expense.

### Plumbing Instrument for Base-Line Work

The device here illustrated is for reproducing a point from below to a point above, or vice versa, and is designed to be used in connection with base-line or other accurate tape measurements, says *Engineering News*. It was devised in the Topographical Bureau, Borough of Queens, of which Charles U. Powell is Engineer in Charge. Distances are measured between points on the tops of small bronze tables mounted on steel extension tripods, the table tops being provided with white celluloid disks on which the measurements are marked. The device consists of a cast-aluminum arm or bracket fitted with a steel



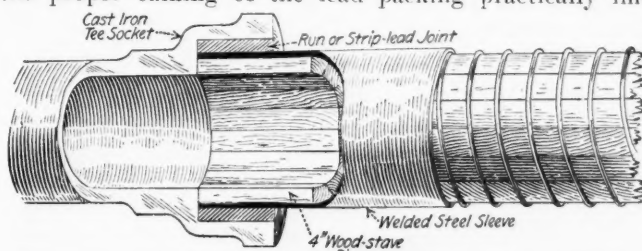
PLUMBING INSTRUMENT FOR BASE-LINE WORK

pointer in the upper arm, and directly opposite it in the lower arm is a hook and eye for attaching the plumb line. It is held in perfect balance by a counterweight of lead incased in brass attached rigidly to the lower arm, all parts made true and centered. In using, the instrument is brought directly over the point below by shifting on its pointer, and its position is marked above. As a test for error, the instrument is revolved 180 deg. on its pointer. The instrument is de-

signed to be carried in the pocket, its overall dimensions being about 4x6x1 in. and its weight 19 oz. A patent is pending. A center supporting rod with short sliding arm is set on the line of the table tops to overcome sag. Pluses are obtained with a steel tape and a plumb-bob. Eight men constitute a party, and from 8000 to 10,000 ft. are measured in a day with an error not exceeding  $\frac{1}{100000}$ .

### Joints Between Cast-Iron and Wood-Stave Pipes

Where special castings for hydrants, valves and other connections are inserted in wood-stave pipe, necessitating a lead joint between wood and iron, leakage is liable to occur owing to lack of adhesion between wood and lead. The difference in density of the two substances makes the proper calking of the lead packing practically im-

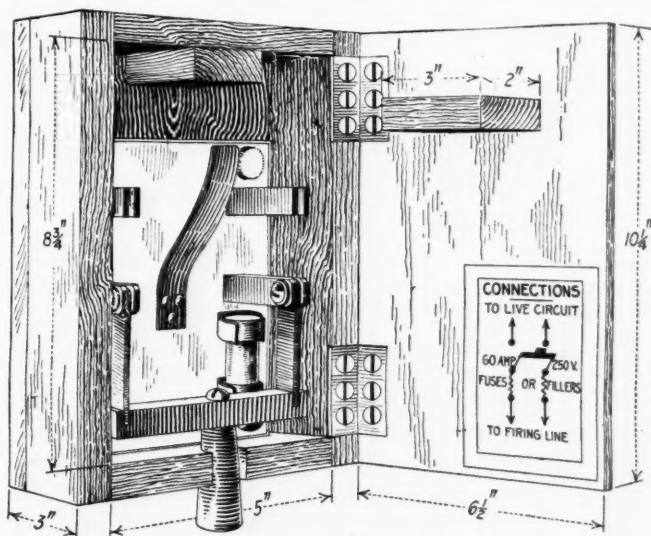


METHOD OF FORMING JOINTS BETWEEN CAST IRON AND WOOD

possible. T. Pridham, in the *Commonwealth Engineer* (Australia), shows a method of remedying this defect by providing a joint that can be made fairly water-tight even under high pressure. The accompanying sketch is self-explanatory.

### A Safe Electric Firing Switch

In electric shot firing two general sources of current are usually employed; namely, by means of a hand-operated generator or directly from a source of electrical energy, says A. C. Daman in the *Engineering and Mining Journal*. If the latter method is employed, it is of extreme im-



AN ELECTRIC FIRING SWITCH FOR BLASTING

portance to have a switch that cannot remain closed after contact is made. In the accompanying sketch, which is self-explanatory, have been incorporated many safety-first details in order to make the switch absolutely foolproof.



# Methods of Working a 3-ft. Bed of Coal Pitching 10 to 20 Deg.\*

BY SAMUEL DEAN†

**SYNOPSIS**—How should the assumed mine be equipped and worked? Many thin beds, both in this country and in Europe, are worked by machines on the longwall system. While this method has many advantages, circumstances may be such as to forbid its employment or render some other means more practicable.

The questions reviewed in this paper are: "Assuming a bed of coal 3 ft. thick, pitching 10 to 20 deg., and lying at a depth of 500 to 1000 ft., what method of working should be decided upon and what kind of equipment should be installed knowing that the coal gives off gas in varying quantities?"

The plan, Fig. 1, shows three pairs of double entries driven to the dip and triple entries driven to the rise. A pair of short entries are also driven to the rise to accommodate the dip hoist, which is placed at the top

bottom to lower them in. The object of this is to prevent collisions.

Figs. 1 and 2 show the air traveling in different directions. In Fig. 2 the main haulage roads are ventilated by intake and in Fig. 1 by return air. I will leave it for the reader to decide which is preferable. Fewer doors are required when the haulage entries are used as returns, but there may be objections to the main hoisting shaft being an upcast in a mine that gives off gas.

In the equipment of this mine there are many questions that have been left for the reader to decide, with the object of promoting discussion. Some of these are the gage of the track, the type, size and capacity of cars and the kind of coal-cutting machines to be used.

I suppose most mine operators are in favor of cars without end doors, and perhaps some may object to heavy topping on cars. If one spends a little time going into the question of track gages, he will be surprised to find how gages and car capacities vary in similar mines, in

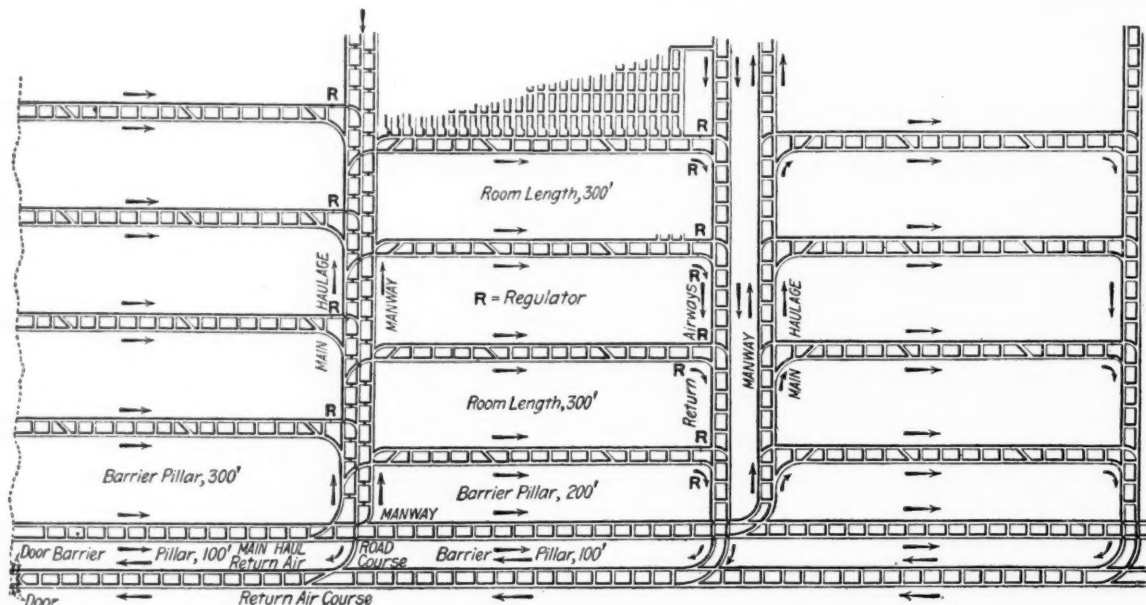


FIG. 1. POSSIBLE LAYOUT OF SUPPOSED MINE

of one of them. The trips from the dip side are hauled up and dropped back to the shaft bottom, where the rope picks up the empty trip.

The arrangement is similar on the rise side. The hoist is shown at the bottom of the central entry, the rope passing over a vertical bull wheel at the top; the loads are gathered by the rope at the room necks off each side entry and are dropped back to the shaft bottom, where the empties are picked up in a manner similar to that in which the cars from the dip are handled. The grade from the shaft to the raise entries is  $1\frac{1}{4}$  per cent. The different trips will stop at certain points until the hoistmen receive signals from the shaft

all parts of this country and abroad. In Europe the car capacities range from 4 cwt. to 2 tons. For instance, in Scotland you can see a 4-cwt. car used in a mine that is similar to a mine in South Wales where 2-ton cars are employed. In this country you can see a  $1\frac{1}{2}$ -ton car in a mine where the coal is about the same in thickness and the pitch and roof and floor conditions are nearly identical with those in a mine where the cars have a carrying capacity of 4 tons.

In West Virginia the tendency has been to increase the width of the gage until mine tracks that are  $56\frac{1}{2}$  in. wide can be seen. This is the standard railway gage. It is the opinion of many, however, that this is too wide; and the popular maximum gage is 48 in.

Little collective thought appears to have been given to the problem. A man opens a mine and buys a few

\*Paper read before the Rocky Mountain Coal Mining Institute, Denver, Colo., Jan. 23, 1917.

†Delagua, Colo.



cars from someone who has them for sale cheap, and whatever the gage of these cars chances to be that becomes the gage of the track in his new mine. Or a large company may open a new mine and use cars from some other mine, and the result is the same. Some companies have installed heavier cars in mines where the track was not suitable for the heavier traffic and the grades have not been studied to facilitate haulage. The result has been unsatisfactory, and the large cars have been replaced by smaller ones.

It is interesting to review these facts before we decide upon the ideal track gage for this particular mine. Cheap first cost is generally aimed at, but it is well to remember that many people are kept poor trying to get rich quick and, as you know, extremely few people get rich in a lifetime in the coal-mining business.

So, what we might try to do is to equip this imaginary mine as it ought to be equipped with a view to enabling us to expect a fair return on the capital invested. With

coal available, the loads should be pulled uphill instead of being dropped down.

What should be the track gage in this particular mine, and what capacity cars ought to be used? Economical haulage considers a minimum number of cars having a maximum capacity. Car lengths are limited by short wheelbases to about 10 ft., the height by the thickness of the seam and ease of loading. To obtain the maximum capacity we have to increase the width of the car, keeping in mind meanwhile the clearance between the rib and the car which state laws and safety demand.

A wide car means a broad gage. With a narrow gage the amount of cutting necessary in the bottom of rooms to provide a level bed for the track is reduced and shorter ties can be used. But it is doubtful if bottom brushing will be necessary on pitches up to about 15 deg. The most common track gages in this country are 30, 36, 42, 44 and 48 in.

We might now consider the weight of the rails. I am a firm believer in substantial track. Nothing is gained by looking too much at first cost and employing light rails. They are apt to spring and cause wrecks the prevention of which soon pays for the difference in the cost of heavier rails.

I should say use 60-lb. rails on main roads, 40-lb. on secondary roads and 20-lb. in rooms. Some operators who are frequently buying rails, especially at present prices, may consider these weights too great; but it may be assumed that a new mine is being started and that it is the intention to prevent derailments as far as possible.

#### TIES ARE ALSO IMPORTANT

Main-road ties should have a 5- to 8-in. face and be 4 to 6 in. deep, according to the nature of the wood. They should project 8 to 12 in. on each side of the rail. Chestnut, oak, or hard pine make good ties. Sawed ties, of course, are not so durable as hewn ties with the bark removed. I think that on account of the seam being not more than 3 ft. thick it would be economical to use steel ties in the rooms.

The following is from a letter written by an engineer in the East with reference to working this imaginary mine. I may say that I am not contemplating opening a mine of this description, as someone suggested after a meeting of the Trinidad chapter of the Rocky Mountain Coal Mining Institute, and trying to get information. The working of this seam has been discussed at two meetings in Trinidad, and what little I have done in connection with it has been purely for the benefit of the organization.

The gage should not be less than 42 in. and the wheelbase of the cars fairly long, about 32 in. The length of the cars should be 10 ft., and they should be as wide as conditions will allow. They should hold not less than 1½ tons of coal. If roller-bearing wheels are used, the grade in the rooms in favor of the loads need not be more than ½ per cent. I recommend roller bearings, as it seems necessary to push the cars in and out of the rooms by hand.

The room entries should be equipped with rope haulage for delivering cars to the main haul. It appears that ordinary electric trolley locomotives could be used on the main haulage roads if they are intakes. If not, storage-battery locomotives could be employed. These are now made for operation in gaseous mines. The writer has had several discussions with Mr. Clark, of the Bureau of Mines, and while the locomotives have not as yet been submitted to the Bureau for testing, it appears that they will be permissible, as they are now being built. Quite a number of storage-battery locomotives are being operated in mines in Pennsylvania where nothing but safety lamps are used, and they have been approved by the state inspectors.

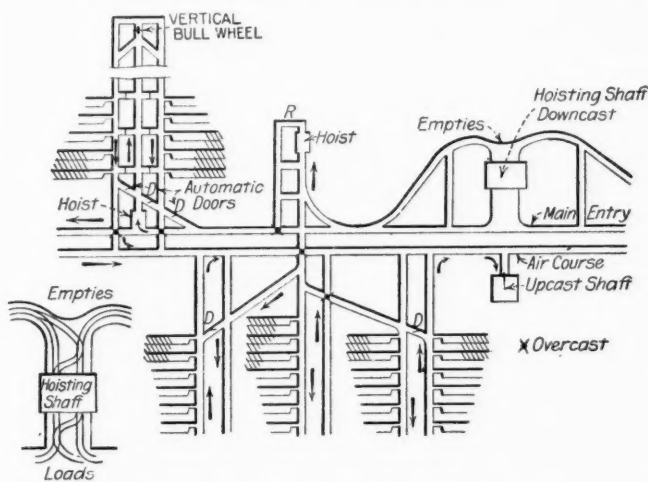


FIG. 2. SOME DETAILS NEAR SHAFT BOTTOM

the room-and-pillar method the rooms are shown driven along the line of strike, or slightly to the raise, allowing the grade to be in favor of the loaded cars. The empty cars would be pushed by the miner from the room switch to the face.

In Fig. 2 some of the pillars are shown drawn, but it is difficult to see how the pillars can be extracted without bringing a squeeze onto the dip and raise entries, which have to be maintained as haulage roads. There is a mine in Colorado that is worked in a manner similar to the method shown in Fig. 2. In Fig. 3 it will be noticed that the main dip entries are protected by barrier pillars and the coal is worked in panels between the main level entries, which are 1000 ft. apart. There is a 100-ft. pillar between each panel, and the reader may determine for himself the best method of working this strip of coal 1000 ft. long by 100 ft. wide.

This method of working may be seen in a 3-ft. bed of coal in Alabama. The hoist for each panel is placed in a crosscut between the two top level entries, and the loads are dropped down to a parting on the level entry below. It is a simple method, easy to ventilate, as the air travels in an ascensional direction, across all the faces, up to the aircourse above the panel and thence back to the air shaft. I am unable to see, however, how the pillars can be drawn and the road kept open for the rope. Consequently, if it is desired to extract all the

The coal should be cut with shortwall machines, but the writer is not prepared to say whether electricity or compressed air should be used for that purpose. Machines equipped with air turbines could be used, and these are worked successfully with a pressure as low as 40 lb., although it is desirable to maintain a higher pressure.

Personally, I should prefer to use an electrically driven shortwall machine, and with proper ventilation and efficient inspection I think it would be reasonably safe to do so. I use the expression "reasonably safe" because there is no such thing as a safe condition or a safe mine.

It might be wise to use concentric trailing cables and plug their ends into flameproof junction boxes. On this subject C. M. Goddard, who has had experience in gassy mines in Australia where electricity was used under the keen inspection of Government authorities, and who has had many years' actual experience with coal-cutting machines and the application of electricity, has the following to say:

A 3-ft. coal seam, on a 15 per cent. pitch, to be worked economically must be mined by machines; and maximum results are obtainable only by the application of electrically driven coal cutters.

The necessity of employing this method is recognized by all modern mining men, and so long as it is applied to working a mine free from gaseous conditions there is little to be said against it. But when it is suggested to use this system in a mine giving off gas, it evokes much discussion and absolute opposition on the part of some men in the coal-mining business and even from those holding positions of importance with Government inspection or local mine safety and insurance bureaus. While it is not by any means a matter to be regarded lightly, yet to intimate that it is absolute folly to attempt the use of electricity at the face of a mine under the list "Gaseous" is going rather too far. In those foreign countries where the details of safety are keenly looked into, operators are successfully employing electric coal cutters under gaseous conditions. There is therefore small reason to doubt the successful installation and operation of such machines in the mine under discussion. Much of the strongest opposition to such practice encountered in any gathering of mining men comes from those who have the least practical electrical experience or knowledge of the characteristics of electricity.

Admitting that electricity in a mine, either gaseous or nongaseous, is not absolutely safe nor can be made so (neither can anything else be made safe), we always have with us from any point considered a certain degree of hazard. There is no added hazard, however, from the use of electricity to such a degree as to make it prohibitive.

#### BRITISH RULES ARE STRICT

The British Government rules and regulations governing electrical installations and operation in gaseous mines "go" American methods along safety-first lines "several better." Nothing is overlooked that would seem to have a bearing on safety, and any mine giving off a small quantity of gas or one not giving off any, but listed as gaseous, gets the same attention in all details as the mine actively forming an explosive mixture. No chances are taken. Main feed lines are installed in the best possible shape. Often these are in conduits, sometimes on the floor, where damage from falling rock is reduced to the minimum.

In the Australian mines the top is generally a conglomerate. Falls are frequent, and a conduit which is waterproof helps materially in conserving the life of feed lines; and as these are daily inspected where not in conduit this simplifies inspection. Indicators on each mine circuit reveal any leak that may be present. If this leak exceeds  $\frac{1}{200}$  of the output of the power house, the troubled circuit is cut out until repairs are made. Mining machines are equipped with flameproof motors, all leads through the frame being protected by a gland or stuffing-box so that they are flame-, air- or gas-proof at that point, although flame-proofing only is required.

Starting-box covers have a ground fit with a male and female connection containing a gasket; leads on the frame of the machine are well protected so that danger of a spark from any source is reduced to a minimum. Round trailing cable is used. This does not kink, as do the flat duplex conductors. The cable is usually armored by No. 14 galvanized wire (iron) and all connections are made to the feed lines through junction boxes. These also contain switches and fuses breaking under oil of a high flashpoint.

The trailing cable terminals are plugs. These are of sufficient length to reach the current-carrying part in the junction

box and at the same time be flameproof. These junction boxes are operated by a large key, and the plate covering the terminal plug hole is raised after the switch is withdrawn from the contacts under the oil. The plugs are engaged by a dog so that they cannot be pulled out while current is passing to the machine.

A deputy has charge of a section of the mine which usually contains three machines. He carries the only key to the junction boxes, unless a certificated man is employed on the machine. The movement of each machine is made under the deputy's supervision. The general inspection and supervision of his district and the moving of the three machines keep him busy.

The coal cutter is moved to within about 50 ft. of the face or to the last breakthrough in the long rooms. The deputy then inspects the working face for gas and other dangerous conditions. If none are found, the place is cut; otherwise the machine is moved out and the place barricaded until it can be made safe.

The machines are also fused in the controller as an additional precaution, but junction-box fuses are made of smaller size so that the break will occur under oil.

If a gas feeder were encountered while undercutting the face, an inspection by machinemen would reveal it and work would cease until the place was made safe. Periodical examinations of the face for gas are a part of the duty of a machine runner.

#### CABLES ARE CHANGED FREQUENTLY

Trailing cables are changed each fortnight whether in serviceable condition or not and sent to the surface for overhauling and inspector's test. Extra cables are kept on each mine section, to be used in case a rupture of insulation occurs, by fall of rock or other cause. A machine runs over and cuts a cable once in a great while, and I recall the experience of one mine using from 12 to 18 machines that had only two cables put out of commission by being run over by the machine truck wheels in two years. This is a rather interesting average compared to the number which are cut in our open-lamp mines.

Trailing cables are taken to the surface for overhauling. Splices in conductors are made properly, soldered on the ends of the splice only, to give flexibility, and insulation is built up of rubber solution and Para rubber, alternately, to the original insulated condition. This is then cleaned, dried, soaked in a tank of good insulating material, waterproofed and then tested in a tank of water to one megohm of resistance between conductor and water; and if found O.K. the cable is sent into the mine for service.

All stations, particularly those underground, are fire-proofed and all current-carrying parts of the apparatus are of ample cross-section, so that no overload that could tax the insulation on any part, including feed lines, is possible. These precautions as well as rigid daily inspections reduce fires arising from electrical trouble to a minimum.

In mines in the United States the electrical apparatus is often credited with starting mine fires. Were it possible to check up such cases it might be discovered that the fire arose from some negligence which had caused a short-circuit. This the power-house man had reported, but no adequate remedy had been applied and the short-circuit goes on record as the one causing the fire.

A 250-volt direct-current installation in the mine under discussion would, with proper care and attention, as under British regulations, cost much more than the usual haphazard methods found in many American open-lamp mines; but money could be saved as compared to pick operation. The risk would be little greater, and a mine so equipped would be a revelation to mining men who are inclined to put the ban on electrical installations in gaseous mines.

It is needless to say that in Europe a coal bed of this description would be worked longwall, but in this country longwall has not, as yet, proved to be very successful outside of a few districts. I have often wondered why 3-ft. seams are worked longwall in the Cañon City district and by the room-and-pillar method around Walsenburg.

Fig. 4 shows a 3-ft. seam worked longwall in Scotland, where face conveyors are used. The seam pitches 10 to 15 deg. The advance headings are 90 ft. wide and carry two roadways. This wide heading is largely employed in Scotland, where it has to a great extent taken the place of narrow work. These headings are cut by machines







full length lateral progression paralyzes the whole scheme of operation.

5. The occurrence of faults, rolls or other irregularities in the seam may cause complete disorganization.

6. The introduction of a conveyor involves, for the time, the abandonment of the possibility of clearing the face by any other means.

7. The cost of timber is sometimes increased.

8. In some cases the necessity for brushing the floor for the double track is a disadvantage; the nature of the strata may render it impracticable.

9. Cars cannot be so fully loaded by conveyors as by hand, and a larger number of cars of a given size must therefore be handled for a given output.

10. In dusty seams a large amount of dust is raised at the discharging end of the conveyor.

11. Contracting with individual loaders is impracticable in most cases.

There are also many other contingent disadvantages such as:

1. Error of judgment in applying a conveyor under unsuitable conditions.

2. Error of judgment in selecting the type of conveyor.

3. Defective design or construction of conveyor.

4. Unskillful operation or defective organization at the face or defective haulage arrangements.

#### WORKINGS SHOULD BE CAREFULLY PLANNED

I will now say something about planning conveyor districts. Before conveyors are introduced the future workings should be carefully planned, and as far as possible the end of the job should be seen before it is started. Advance planning has not, in the past, been taken full advantage of in room-and-pillar mines in America. There appears to have been some old-fashioned prejudice against it.

Mechanical conveying, however, has opened a new era in the mining of coal and may have an even more important influence than coal cutters on future methods of laying out the workings of coal mines. But the full advantage of conveying as a system will not be obtained by conveyors operated as individual and isolated units.

As a well-known mine manager recently expressed it: "Machine mining is not a machine put in here and there at random to cheapen a particular district, but a well-defined and organized policy to work complete areas—areas properly laid out with an eye to the future."

The relation of the line of face to the cleavage planes in the coal is important; 30 to 35 deg. is probably the most suitable relation in strong or tough coal as the coal is then easier to break down. At least this is the opinion of some people. I find that local miners generally prefer to work directly on the facings of the coal, but this may be on account of the nature of the seams. Faces parallel with the true line of dip of the seam are the most suitable, but a small departure from parallelism is permissible.

I will now refer to roof control, which will perhaps be of more interest than anything else. I will state first that there are many longwall mines in England where the roof gives much trouble. Longwall mining, even over there, is anything but universal plain sailing.

The factors in the problem of roof control are so complex and difficult to comprehend that, although certain broad principles may be accepted for general guidance, the treatment of individual roofs is generally gov-

erned by the opinions and experience of local officials at the mine. The behavior of most roofs appears to depend upon discovery through intelligent observation of the mode of management best suited to each individual case. The "goodness" or "badness" of a roof is often the measure of the skill with which it is managed.

The control of the roof in pillar workings, at the mine with which I am connected, has always been an interesting study to me, and I think the ability and value of a pit boss can generally be gaged by his method and results in handling the roof when drawing pillars. Illustrations in abundance might be quoted of roofs that were formerly difficult and dangerous being perfectly amenable now that the appropriate treatment has been discovered and systematically applied.

The most that I can attempt here is to submit a few general observations and to give a few examples of methods that have proved successful under the conditions in which they were applied. These may contain features or suggestions for trial in other cases.

Conveyors have, so far as roof control is concerned, introduced new problems which require careful study. These arise from the necessity for maintaining a perfectly straight line of face, which must be kept clear of

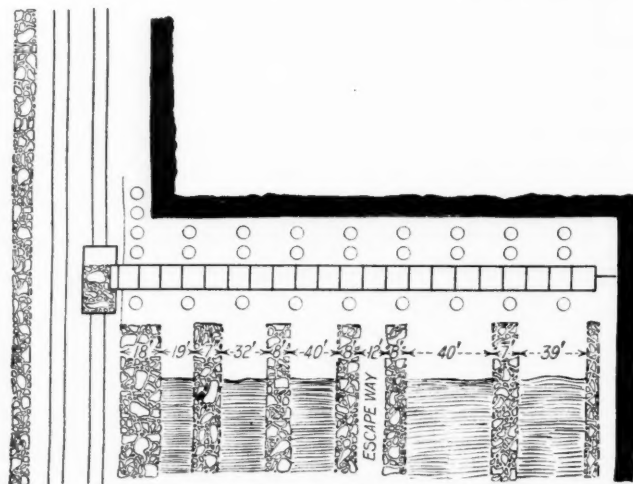


FIG. 5. ARRANGEMENT AT CONVEYOR FACE

falls from one end to the other. Where coal cutters are used a greater width of exposed roof has to be supported between the face and the gob. The character of the roof may prevent the joint use of coal cutters and conveyors and the alternative may be presented of selecting one or the other. The choice will, of course, be determined by the cost of getting the coal by hand. Quick and regular advance of the face is always an important factor in roof control, and many roofs which behave well when a steady advance is possible soon give trouble if allowed to stand.

A band of rock or dirt in the seam worked with gate roads may be, for lack of gob space, an expensive nuisance; but with conveyors it becomes an asset worth cents per ton. If packing material is not available either from above or below the coal, then the use of a conveyor may be out of the question unless we can induce the roof to break, in the goaf, behind a line of breaker props or cribs.

Soft and brittle roofs which bend down from the coal head, or are so brittle that they break up at the face, give much trouble with conveyors, especially in thin

seams where the sagging roof may not leave sufficient height for the men or debris from falls may not find job room behind the conveyor.

Many conveyors are, however, in successful operation under roofs of this character, but there has to be systematic crossbarring and propping at the face and the back timbers have to be withdrawn. Roofs of this kind are frequently better without any support in the goaf and are usually best managed by a row of hardwood pillars or a line of breaker props to shear off the roof and allow it to close to the floor behind the conveyor.

Under roofs so brittle that they collapse to the floor behind the conveyor at intervals of one or two days, the pressure on the coal is so much reduced that hand mining is no longer possible and machines have to be introduced.

The most difficult roofs in relation to conveying are probably the strong and inflexible ones which will not bend down into the goaf and which cannot be induced to break at the desired times and places. Where the cleavage planes in such roofs are irregular, or the immediate roof stratum is brittle, there is liability to considerable falls at the face; and where the rock is tenacious the advance of the face increases the hanging weight until the roof shears off at the coal head, crushing down irresistibly upon the timbers and closing the face.

This was the experience I had when trying to work re-treating longwall at Delagua, Colo. some years ago. I still believe, however, that if I were tackling the job again I could get better results. I had a 200-ft. face with the cars traveling along it. This was certainly a coal factory before the weight came on.

In many such cases the manageableness of the roof depends largely upon the nature of the floor; the difficulties are greatly increased if the floor is too soft to afford the necessary resistance to enable the timbers to break off the roof in the desired line.

#### SUCCESSFUL USE OF BREAKER PROPS

One or two actual examples of successful application of breaker props to induce fracture of strong roofs may be interesting. A 3-ft. 6-in. bed of clean coal lying at a depth of 780 ft., with a stratum 8 ft. thick of shale as immediate roof, and above this 40 ft. of sandstone rock, was worked by hand on a face 240 ft. long with a full-length face conveyor. The roof was brushed for material and eight pack walls, each about 12 ft. thick, were built at right angles with the face. For protection of the face wood cribs 4 ft. square were built at intervals of 6 ft. and allowed to remain.

The face, however, was closed several times by the roof breaking at the coal head and collapsing to the floor; this led to abandonment, for a time, of conveying. After a lapse of several months the face was again opened; a line of breaker props 7 in. in diameter was set behind the conveyor, and neither pack walls nor pillars were built in the goaf. The result has been entirely satisfactory, and in this case a complete solution of the difficulty has been secured. The breaker props are recovered and the cost of timbering is now considerably less than formerly.

Another example is that of a conveyor face 240 ft. long in a clean seam 4 ft. thick, at a depth of about 2400 ft. from the surface. The immediate roof in this case is 60 ft. of sandstone rock.

On account of the heavy rock roof the management had considerable hesitation in venturing to introduce conveyors, and the high cost of brushing gate roads was the determining factor.

The breaker-prop method was the only one adopted, and it has been entirely satisfactory. The breaker props used at first were of larch, 8 to 9 in. in diameter, but props 3½ in. in diameter incased in steel tubes and capped with soft wood caps 1 in. thick are now used and are much preferred. This face, of which Fig. 5 is a plan, is advanced 4 ft. per day and the conveyor is moved forward each night.

Immediately the back row of props is withdrawn the rock shears off close to the standing props and collapses between the rock pillars. The props are not set quite vertically, but the tops are inclined about 2 in. toward the goaf; as the face moves forward the roof pressure pushes the tops of the props toward the face, so that they are almost vertical when at withdrawal.

Roof breaks, close to the face, occur at irregular intervals, but the subsidence is only about 1 in. The angle of fracture of the roof varies from 60 deg. to almost vertical.

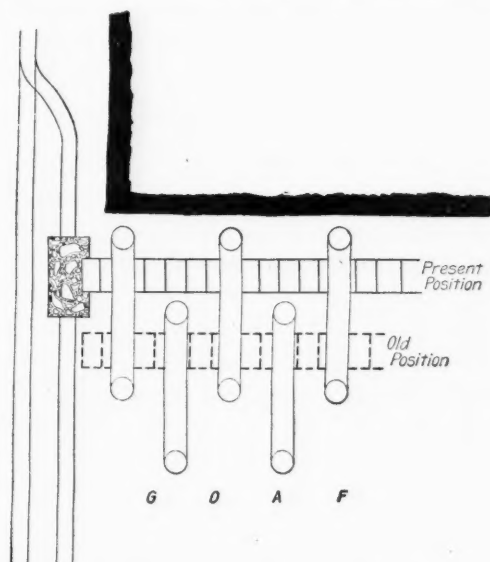


FIG. 6. CROSSBARRING AT THE FACE

The pack wall at the roadside is 18 ft. thick. The pack walls in the goaf are continuous and are built forward with the rock that falls between them.

When the first conveyor face was started in this coal bed three escape roads were brushed in the goaf for escape of the men in the event of a crush taking place, and the distance between the pack walls was maintained at 24 ft. But as the men gained confidence the number of escape roads was reduced and the distance between the pack walls was increased. Experience has demonstrated that this arrangement, as shown in Fig. 5, is best suited to the conditions.

It is important to the use of breaker props that the floor be hard and unyielding, to give the necessary resistance along the line at which fracture of the roof is to be induced. While this method has many successes to its credit, it has in some cases failed. Where the roof is so strong that it refuses to break regularly, the back props may become so tight that they cannot be withdrawn. The pressure in this case increases as the face advances and



finally causes a break along the face of the coal. The roof then crushes all the timber to the floor and closes the face.

Under many roofs that will not stand temporary complete withdrawal of a line of props, the bodily moving of the conveyor may be rendered practicable by the use of crossbars set at right angles to the face and at such intervals as the nature of the roof requires. Fig. 6 shows a method frequently employed. Bars about 5 ft. 6 in. long are used, and before the conveyor is moved a new set of bars is placed, each bar supported by two props. The props and bars previously in use are then withdrawn and the conveyor is moved bodily forward.

Fig. 7 illustrates systematic conveying as practiced at Langley Park Colliery in the County of Durham in England. Pillars of coal 360 ft. square are formed, and conveyors on each side carry the coal to a central conveyor

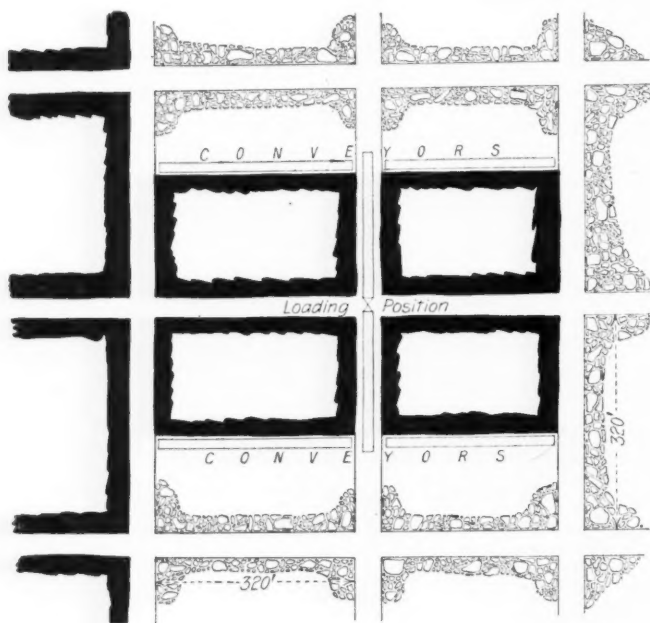


FIG. 7. SYSTEMATIC CONVEYOR MINING PRACTICED IN ENGLAND

which delivers it to a fixed point where the cars are loaded. Twenty-six thousand tons of coal are loaded at one point.

I will now quote some remarks recently made by Sam Mavor, of Glasgow, who has had many years' experience with conveyors:

One of the impediments to the innovation of face conveyors is that suitable preparation of the face and of the haulage facilities as well as the provision of adequate organization, involves considerable expense.

There is therefore a natural inclination to proceed tentatively, in order to get the conveyor started at the least outlay and to see how it will work, with the intention to deal thoroughly with all the requirements after the conveyor has shown its capabilities. This is one of the roads to failure.

The inauguration of a new system which not only involves changed physical conditions but also a complete redistribution of labor is sufficiently difficult when every provision is made that experience can suggest and intelligence foresee.

Where to physical difficulties are added indifference or prejudice of the men and lack of faith of the officials, success is well nigh impossible.

It is proper to exercise caution in regard to the introduction of a system which is pregnant with new and perplexing problems, but when the step is once decided upon the time for caution is past and a bold, determined and constructive policy is the most direct and surest means to success.

The writer is indebted to Sam Mavor, of Glasgow, Scotland, for many of the remarks relating to face conveying and for the drawings, Figs. 4, 5, 6 and 7.

## Inquiries Into Mine Gases and Dusts

By VAN H. MANNING\*

During the year 1916 important work was undertaken by the United States Bureau of Mines in regard to the gases found in mine workings. A methane indicator for use in mines has been developed under the direction of George A. Burrell, assisted by G. A. Hulett, consulting chemist, and others. It is believed that the device is the first practical, accurate and simple gas-detector for use in mines. The device can also be used with great advantage for detecting such combustible gases as natural gas, artificial gas, hydrogen, acetylene, etc. An investigation is under way to determine whether or not hydrocarbons other than methane are present in firedamp.

A bulletin is being prepared giving the results of analyses of mine gases from nearly all the coal fields of the United States. Many mine-gas samples were analyzed in connection with the field work carried out by the engineers of the Bureau of Mines. The samples included those obtained from mine-fire areas and from atmospheres containing firedamp and blackdamp, those collected after mine disasters, and those secured in the experimental mine in the course of tests.

In connection with the investigations on limiting or preventing dust explosions in coal mines, it becomes necessary to determine accurately the percentage of combustible carbon and hydrogen in clays, shale, limestone and other materials that may be available for rock dusting a given mine. Obviously, the material that contains the least combustible matter is most suitable. The usual method of determining total hydrogen and carbon do not give sufficiently accurate results, as they do not differentiate between combustible organic carbon and noncombustible organic carbon from the carbonates, nor do these ordinary methods distinguish between the organic hydrogen and the hydrogen in the combined water present in shales and clays. A simple method has therefore been devised whereby only the true combustible is determined.

In applying stone dust in mines for limiting explosions, it is of great assistance to determine quickly and on the spot the approximate percentage of noncombustible matter in the road and rib dusts, in order to determine how much additional limestone or shale dust is required to prevent propagation of dust explosions.

For this purpose the Taffanel volumeter has been modified and combined with a convenient portable field equipment. This outfit, planned by A. C. Fieldner, chemist, consists of the volumeter, pipette, balance, funnel, alcohol can, sampling scoop, sampling cloth, etc.

## COMING MEETINGS

**The Southern Appalachian Coal Operators' Association** will hold its annual meeting at Knoxville, Tenn., Feb. 13. Secretary, James E. McCoy, Knoxville, Tenn.

**American Institute of Mining Engineers** will hold a meeting Feb. 19-22, at 29 West 39th St., New York City. Secretary, Bradley Stoughton, New York City.

**Canadian Mining Institute** will hold its annual meeting at Montreal, Canada, Mar. 7, 8 and 9. Secretary, H. Mortimer Lamb, Ritz-Carlton Hotel, Montreal, Can.

**American Society of Mechanical Engineers** will hold its spring meeting May 21-24, 1917, at Cincinnati, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

\*Director, United States Bureau of Mines, Washington, D. C.



## Some Goings and Comings

BY FLOYD W. PARSONS

*SYNOPSIS—An account of the annual dinner of the Engineers' Society of Northeastern Pennsylvania at Scranton, and the winter meeting of the Rocky Mountain Coal-Mining Institute at Denver. The people who were there and some of the things they said. Also side talks with a number of important people who are doing things.*

Getting on the train in New York late in the evening I still had in my bag a few letters that remained unopened. One of these was from Baird Halberstadt over in Pottsville. He says:

Your Coal Review Number has just reached me, and I am so delighted with it that I must tell you so at once. It is just what a busy man needs if he wants to be in touch with the coal trade of the United States. The contributors, most of whom I know, are qualified for the work they had in hand, and a natural result followed. It is a fine number, and I want to add my congratulations to the many which should be offered you.

More than fame and more than money is the comment kind and sunny,  
And the hearty, warm approval of a friend;  
For it gives to life a savor, and it makes you stronger, braver,  
And it gives you heart and spirit to the end.  
If he earns your praise, bestow it; if you like him, let him know it;  
Let the words of true encouragement be said.  
Do not wait till life is over and he's underneath the clover;  
For he cannot read his tombstone when he's dead.

You say, "What's that got to do with the meetings in Scranton and Denver?" Nothing—except there's a lesson. How long does it take to say or write a word of kindness and appreciation to some fellow, even if the opportunity and cause are slight? Read that verse of Halberstadt's again. Isn't every word true? That's the secret of his popularity; he practices what most of us only preach. It would be better if we all wrote shorter letters, but more of them.

### ARRIVING IN SCRANTON

When the porter called me at 7:30 and I went out to the washroom I knew right away I was in Scranton, for a big man in a gray suit with a brown hat and a heavy face was talking to a smaller man with a red necktie about some coal they had sold that wasn't any good. The little fellow said one dealer told him he couldn't conscientiously sell the lot he had bought. The big fellow took exception to the idea that a retailer had a conscience. That point was carried unanimously, but it was decided the coal would have to go at a reduced price.

In going over to Wilkes-Barre later in the morning on the "Laurel Line," the tracks touched the old "Heidelberg" colliery of the Lehigh Valley Coal Co., and in memory I was carried back to 1902, when as transitman for the "Valley" company I had been obliged to locate by survey and plot on our company maps the proposed new electric line. It was my first experience with a railroad spiral.

One fact stood out as we traveled along—that the collieries are much better kept today than heretofore. Prospect and some of the other mines present a tidy appearance with their whitewashed fences and their clean grounds. If a man can work with greater efficiency when his desk is in order, so is it true of a mine that better results follow cleanliness and order.

Did you ever notice that semi-important officials waste more of your time by keeping you waiting to see them than do the really big fellows who have great pressure of work and heavy responsibilities? Arriving in Wilkes-Barre, I stepped into the fine new office building of the Lehigh Valley Coal Co., sent word up to Mr. Chase via the doorman and the telephone girl that I would like to see him a few minutes. The immediate response was, "Come right up." He was busy at the moment, but like most men whose time is valuable, he realized fully that the minutes of others are likewise precious. When such men are tied up in conference, or in other urgent business, they tell you so and arrange a meeting at a later and more convenient hour. If they can see you, they do it at once. Nothing is so ludicrous and pitiful as the aping of importance by someone who is not important.

The time is coming when we will all observe a code of conduct in our business dealings that will stamp a man as a gentleman just as surely as do such little things as the removal of one's hat in the presence of ladies. The man who on calling finds us out and leaves his card will receive a note expressing regret. Most successful individuals no longer believe that gruffness is a necessary accompaniment of greatness. The "Well, what do you want?" type of man is disappearing, like the coyote and the copper-head, and for the same reason.

### THE MEN YOU CAN'T SEE

I was talking to several coal men recently; two of them spoke of the impossibility of reaching a certain big hard-coal official. I had never experienced any difficulty in seeing this man, but I realized that this might be due to my having known him before he had climbed so high. At any rate—I know one thing—the two men who couldn't get to him haven't forgotten and won't forget. Both of them are still young and going strong. Their future is bright, and who knows but that some day the tables may be reversed. "Chickens come home to roost." Isn't it better to deal out a smile and a handshake, then shunt the caller to the proper party who can give him more time and attention?

Returning to my visit with Mr. Chase. I found him puzzling over charts that graphically portrayed the close relationship between labor, cars and production. The point that stood out was this: If you get your men out to work and then have to close down during the day because there are no cars, you not only hurt that day's production but the next; for men so disappointed say to themselves the next day, "What's the use going in; we'll probably not get in a full shift." It's funny that big railroad companies that are indirectly in the mining business should fail to see the folly of lay-offs due to car shortage. If the heavy overhead charges of mining would lay off at the same time, their seeming indifference wouldn't be so surprising.

Right here is a question, and I would like to have someone discuss it. How are the anthracite mines, with their new 8-hr. law, going to get the miners to work 8 hr.? Why are men content to earn less when they might earn more? Isn't it a question of at first hiring the right kind of men? The foreword in *Coal Age*, Jan,

27, took up this matter in detail. Those who haven't read that foreword might do so with profit, although many mining men will say "It's easier to talk about these things than do them."

Leaving Mr. Chase, I lunched with Ed. Parker, instigator of anthracite statistics and founder of hard-coal facts. Mr. Humphrey, mining engineer for the Lehigh Valley Coal Co., joined us. When you want to learn something about something, sit down with an engineer on your right and a philosopher-economist on your left, and you are sure to get the wherefore as well as the why of the matter. The pages of *Coal Age* always profit by reflecting the ideas gathered by its editors in their visits with the mining men who are actually in harness and doing things.

#### ENGINEERS' DINNER IN SCRANTON

The dinner of the Engineers Society of Northeastern Pennsylvania was held at the Jermyn in Scranton and was largely attended as usual. President A. H. Storrs was succeeded in office by Frank J. Duffy. Harry A. Smith was toastmaster. He told a lot of interesting stories. Here's one on the new president. Duffy bought a new Ford, and one day in turning a corner he ran into a large limousine, doing considerable damage to both cars. McCarthy, the Irish cop on the beat, came up and commenced berating Duffy for his bone-headed driving. Finishing his tirade he said, "And what's your name?" Frank answered, "My name's Duffy." The cop replied, "And is it now? Well, will ye be telling me how that Hebrew came to back into ye?"

Captain Anthony Fiala, the noted Arctic explorer, was present and gave an interesting recital of his experiences in trying to reach the South Pole. Other guests and members spoke, and there was plenty of good music. These E. S. of N. P. annual dinners are a great success. Few who go once but become regular attendants.

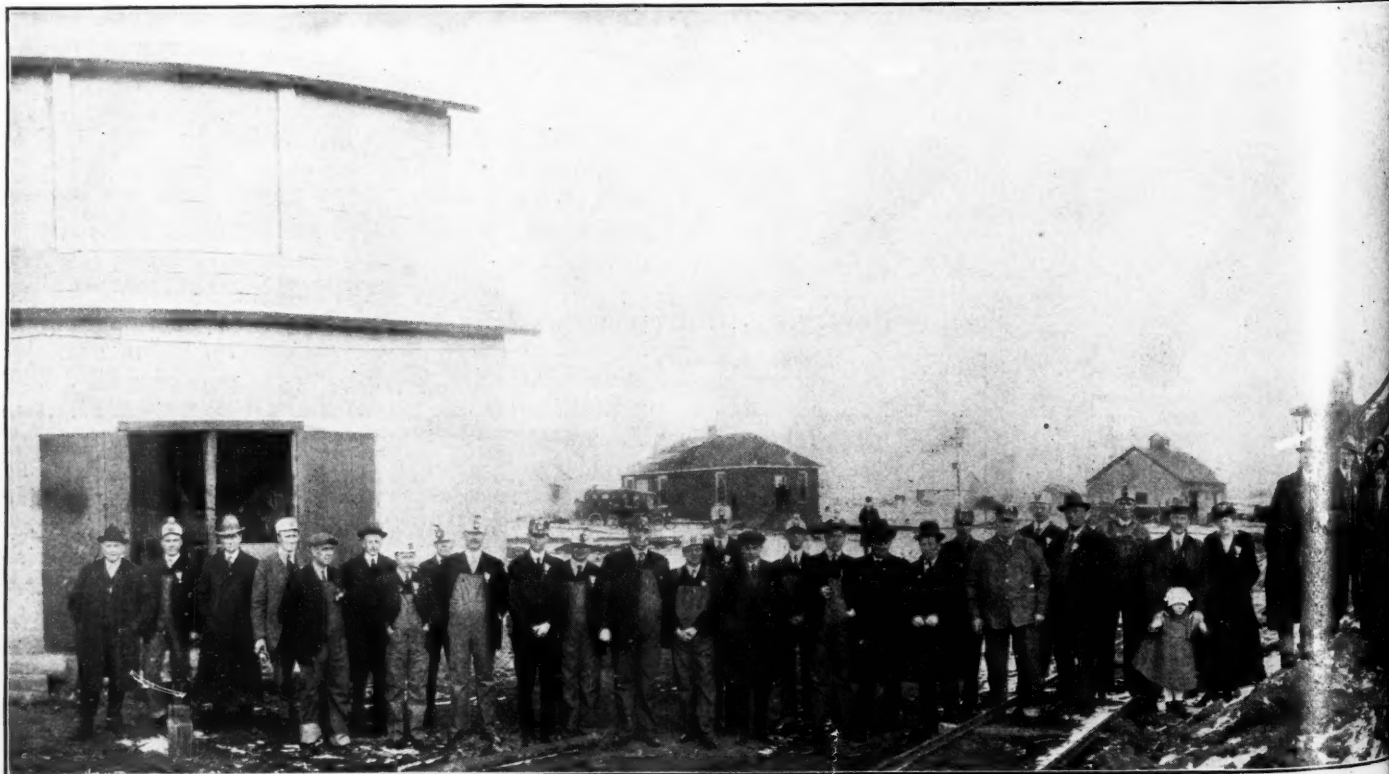
In Chicago all the coal crowd were happy. There are only two burrs in their bed of contentment—cars and labor. The atmosphere is dark and heavy with prayers for more men and adequate transportation. In the evening, at dinner, Carl Scholz told me of a discovery he had made; the details, however, will not be made public for several months. Coal men will be interested.

#### WESTERN HOSPITALITY

The Rocky Mountain crowd met in the convention hall of the Albany Hotel in Denver, Monday morning, Jan. 22. President Watts came on from Salt Lake and presided. Before the morning session was over I had dated up and saved my company the cost of my meals for the entire three-day session of the convention. It costs a lot to get out to Colorado, but once you are there Western hospitality takes care of the rest. George Anderson, of the American Steel and Wire, was on hand just as blond and smiling as ever. Lindrooth and Shubart, the old standbys, were present. It's funny how hard thinking in prosperous times wears a fellow's hair off his head. Urquhart had a new story. I can't write it here; we had trouble once before with the postal laws. In machinery discussions he objected to the word "oiling," says lubricate is better. You see you can say "lubricate the bearings with grease," but not "oil them with grease." By the way, what is it Urquhart sells?

Mr. Fields, formerly of New England, but now connected with Columbus interests and living in Denver, was in attendance and hasn't lost any of his good looks or dignity. Mr. Fields has changed less in the past decade than any of the rest of us. I'll bet if he was watched for three consecutive mornings just before dawn it would be found that he slips out into the foothills and drinks of some hidden fountain of everlasting youth.

Weitzel, Mattison and Hosea came up from Pueblo to represent the C. F. and I, while Whiteside, Hills and



SOME OF THE MEMBERS OF THE ROCKY MOUNTAIN COAL MINING INSTITUTE



Dean were prominent from the Victor-American. David Griffiths was on hand and bubbling over with good nature. Messrs. Dalrymple and King were present from the State Inspection Bureau, and O'Brien, general manager of the Stag Cañon Co., came up from Dawson, New Mexico. O'Brien was worried; he had put a \$1000 check in a New York bank and had been credited with \$5000. None of us could find out what there was in that to worry a man. Someone said his loss in appetite was due to fear the bank would discover their mistake.

Frank Manley made us all happy by showing up, for his absence last summer in Salt Lake put a damper on the proceedings. As the hours wore on, more and more of the "old guard" began to assemble, and it was very soon evident that this was to be the best winter meeting ever held. "P. J." Quealy, William Monay, George Pryde, Tom Gibson and Peter Kooi were among those from Wyoming. This array of talent was further reinforced by another celebrity in no less a person than "Bill" Brennon. Bill got up from a sick bed to be with us and was quite overcome by the tender solicitude of his friends. Mr. Kooi knew Bill wasn't going to be feeling well, so he brought some medicine with him from a point farther East. I know he brought the medicine with him, for Colorado, you know, is now a prohibition state. When the others found that Mr. Kooi was going to cure Bill, an epidemic developed and several cars were required to carry the sufferers to Mr. Kooi's benevolent establishment at the Brown Palace, where first aid was applied.

On Monday night the coal men were entertained by the Denver Athletic Club at a boxing and wrestling tournament. About fifteen bouts were pulled off and some of them were quite exciting. Tuesday afternoon was devoted to a visit to the Puritan Mine of the National Fuel Co. Harry Van Mater, president and general manager of the company, entertained the members of the Institute at a real luncheon with all kinds of trimmings.

Absence of a cabaret was not noticeable, for Jack King was present and furnished conversation that was extremely diverting and wonderfully entertaining. When Jack isn't selling Roebling rope he sure shines as a social light. Tuesday evening was spent at the stock show.

The institute reelected Mr. Watts president and Mr. Whiteside secretary-treasurer. John McNeil, T. H. O'Brien, G. A. Murphy and William Monay were elected vice-presidents from Colorado, New Mexico, Utah and Wyoming respectively.

One matter came to my attention while discussing ways and means with my Rocky Mountain friends, and that is the bonus system as it is being worked out by coal companies in Colorado. One of the largest companies has adopted what looks to be an interesting and effective scheme. I trust some *Coal Age* readers will comment on the system. Here is the plan as outlined in a notice that this particular company recently posted:

Effective Jan. 1, 1917, and continuing until further notice and while present conditions exist, a bonus will be paid to employees, both miners and company men, on each two weeks' payroll, for an increase in the average tons of coal produced per day for each miner on the payroll.

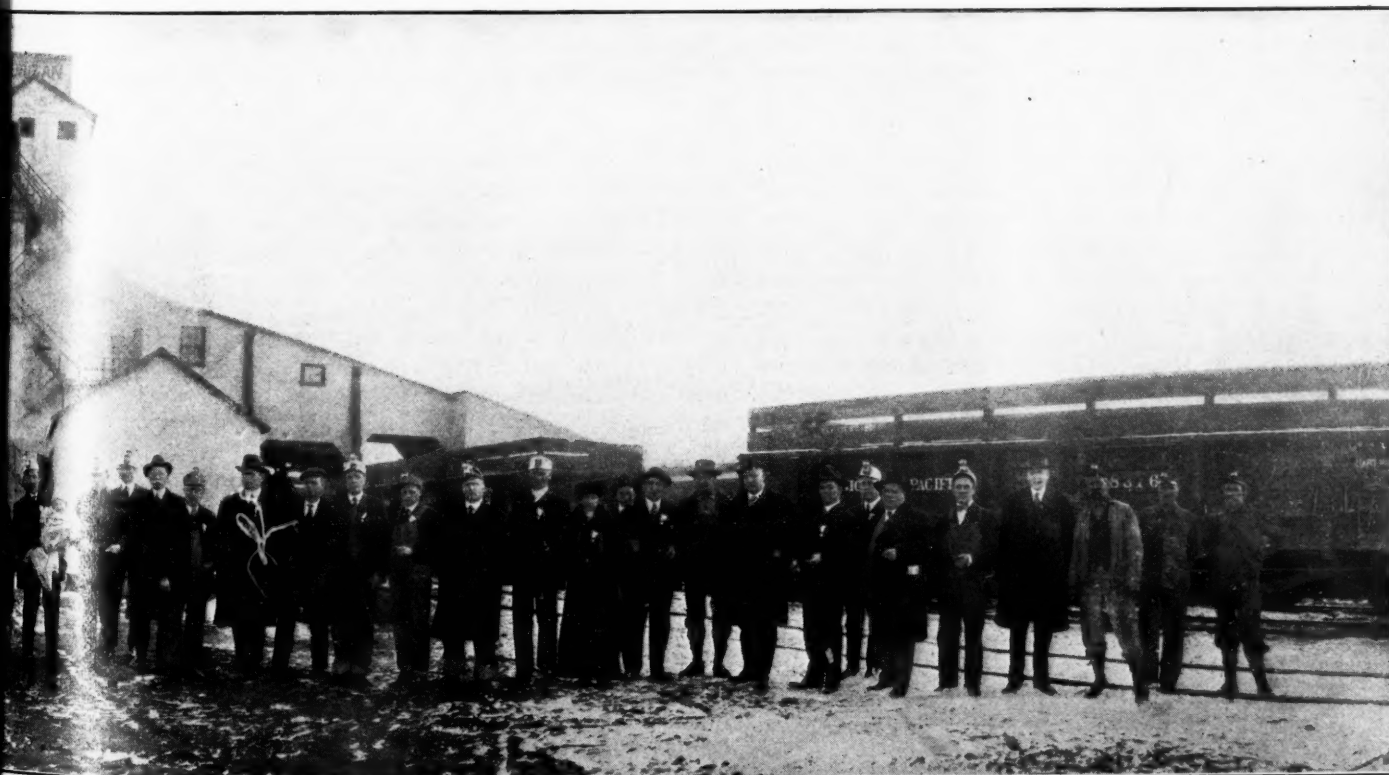
Thus, if a miner works more days per week, or sends out more coal when he does work, and the company men keep their work running smoothly, it will raise the average for the mine and will benefit all alike.

The average for the four months has been exceeded several times during that period, and a little teamwork should keep the output above the average.

#### THE WAY THE BONUS WILL BE FIGURED

		Bonus	
		To Each Miner On His Tonnage	To Each Company Man On His Total Earnings
The average for each miner on the payroll for each day the mine worked for the four months' period ending Nov. 30, 1916, was . . . 5.45 tons			
Bonus shown opposite each item will apply when the average for each miner on the payroll for each day the mine works is:	5.55 to 5.74 tons	1c.	1 per cent.
	5.75 to 5.94 tons	2c.	2 per cent.
	5.95 to 6.14 tons	3c.	3 per cent.
	6.15 to 6.34 tons	4c.	4 per cent.
	6.35 to 6.54 tons	5c.	5 per cent.
	6.55 to 6.74 tons	6c.	6 per cent.

Any average in excess of the above will be taken care of pro rata.



VISITING THE PURITAN MINE OF THE NATIONAL FUEL CO. IN COLORADO



## METHOD OF COMPUTING BONUS

1. A count was made of the miners who worked two days or more during each half-month payroll. Averaging these eight periods gave the average number of men employed during the four months.

2. A count was made of the number of days the mine worked, excluding Sundays.

3. The production of the mine was taken for the four months after deducting all company coal and coal produced on Sundays.

4. After multiplying the average number of miners on the roll by the number of days worked, this product was divided into the production for the four months—the result being the average tonnage for each miner on the payroll for each day the mine worked.

As you will observe from the notice, an increase in cents per ton applies to each miner and an increase in percentage to each company man for an increased average production for each miner. The bonus will apply to all miners and company men, including monthly men, with the exception of the superintendent.

In figuring out a scale on bonus to be applied to an increased production, we find that several times during the four months' period a considerable tonnage has been produced in excess of the average, and it therefore puts the bonus within reach of the men if they do no better than they have done during some of these periods; and it ought to be an incentive to keep up the output.

When you consider this matter, you will notice that on account of the average being based on the average number of men on the payroll (not on the men producing coal daily as we usually figure it) and being further based on the number of days worked by the mine, there will be a possibility for the men to increase the tonnage of coal per miner from three directions:

1. If a miner works more days per week.
2. If his efficiency can be increased and he sends out more coal when he does work.
3. By the smooth and continuous operation of the mine, which enables the company men to assist in the increase in output. By additional care, etc., toward preventing accidents to machinery, tracks or any interruptions which would interfere with the production. It is assumed that the company men will look after this part of the business, and no delays of any nature outside of full day have been considered in arriving at the average for each miner and will not be considered in arriving at the average for computing bonus.



## Recollections of a Manager

Occasionally, our board of directors held their monthly meetings at my office; this occurred when it was necessary to make use of wall maps or other data difficult to move.

One afternoon, when the directors were in my office on such a mission, Frank Elliott, an organizer of our miners' union, walked in unannounced; it happened that my office boy had left his post for a moment, and the man walked in entirely unconscious of the fact that he was doing anything out of the ordinary. He realized his mistake almost immediately and started to retrace his steps without so much as a greeting, but one of the directors stopped him.

"We've just been talking about your crowd; come in and say something for them," was the way Mr. Wright put it.

Elliott wheeled instantly, controversy was quite to his liking.

Mr. Wright had always been bitterly opposed to labor unions, so bitter in fact, that he found himself somewhat out of sympathy with the other members of the board; his challenge was not only meant for Elliott, it was clearly meant for every one in the room.

"Say, Elliott," Mr. Wright continued, "will you please tell me how you fellows can find nerve to tell us where to get off in our business; yes, sir, our business, lock, stock and barrel. Do you realize that?"

Elliott, without a moment's hesitation, replied, "If the business belongs to you fellows—lock, stock and barrel—why do you complain when we act as if we had no interest in it?"

Mr. Wright was floored completely. There may be an answer to the question asked by Elliott, but he was not familiar with it, nor were any of the other directors for that matter.

Suddenly it seemed to Mr. Wright that some of the facts about the so called "future democracy of industry" were worth looking into after all, and much to the surprise of every one present he shoved a chair out to Elliott and asked him to be seated.

If all labor leaders had Elliott's point of view, and were able to carry conviction as did Elliott that day, employers would no longer fear unionism. So completely were we carried off our feet, that we even allowed him to talk about "industrial slaves" without showing any resentment. As a matter of fact, he convinced us that many of the pet arguments of employers can be made to appear ridiculous by resurrecting the arguments the slave-owning class made use of to justify their position.

As a result of that chance visit Mr. Elliott was given a standing invitation to come before our board whenever he had matters of interest to discuss.

Several months elapsed before he did come, and on that second visit he found that every member of the board had familiarized himself with everything published on the subject of "industrial democracy," and they had many questions to ask.

This time Mr. Wright redeemed himself in a way by asking several questions that Mr. Elliott could not answer. After that Mr. Wright and Mr. Elliott became the best of friends.

We didn't take steps to inaugurate industrial democracy as a result of Elliott's teachings, but we came to believe that possibly our children's children might be called upon to do so.



## Waste at Byproduct Coke Ovens

BY E. B. WILSON\*

One of the first products separated by the distillation of coal tar is benzene, or benzole,  $C_6H_6$ . At the time that Perkin discovered aniline dyes, all benzole from which they were made was obtained from gashouse coal tar. As the amount was small, the price soared to \$3.75 per gal.

When the Germans introduced byproduct coke ovens, they commenced the recovery of benzole from the coke-oven gas; and this immediately caused the price to go down and permitted them gradually to obtain control of all the dye trade. The war has changed conditions so far as the dye trade is concerned in this country, but not all the byproduct oven plants are saving benzole from the gas they make. Retort coke ovens were supposed to be constructed primarily to save the byproducts that the beehive ovens burned. However, they are not all run on that line, and one of the most useful products of them all—coal tar—is burned when it accumulates faster than it can be utilized by the purchasers. This waste could be stopped at comparatively little expense, should the owners introduce tar-distillation plants, as the following remarks will show.

\*Scranton, Penn.

In making coke in a byproduct-oven plant, each ton of coal coked gives off about 10 gal. of coal tar having a specific gravity of 1.009, thus giving it a weight of 8.1 lb. per gal. According to a recent article in *Coal Age*, coal tar was sold at the ovens, so far as possible, at 28c. per gal. That readers may follow this discussion readily, it is assumed that there is a plant of 100 byproduct coke ovens whose capacity is such that 1,000 tons of coal is coked daily. This would furnish 10,000 gal. of coal tar that would weigh 42 tons and yield an income of \$300 per day to the coke maker, if it were all sold. However, if it were treated in a continuous tar-distillation plant, it would furnish returns that would pay for all the labor of making coke and the tar distillation as well. Further, none of the valuable material would be burned under boilers and in openhearth furnaces. From an actual run of five weeks on byproduct coke-oven tar in a continuous tar-distilling plant the following quantities of six fractions were recovered at a cost of 28c. per ton of tar distilled. This price includes repairs, taxes, insurance, labor, superintendence and office expenses—in fact, is bedrock. Figuring on 42 tons daily, the returns would be:

273 gal. of 3 per cent. ammonia liquor, or 267 lb. of $(\text{NH}_4)_2\text{SO}_4$ @ 3c	\$8.01
117.6 gal. naphtha @ 10c	11.76
994 gal. light oil @ 10c	99.40
1,722 gal. creosote oil at 5c	86.10
726.6 gal. anthracene oil at 5c	36.33
5,500 gal. pitch @ 6c	330.00
	<hr/> \$566.60

Deducting the cost of distilling and the price received for the tar when sold, there remains a balance of \$254.96, or if the tar is burned, there is a waste of \$566.60 per day. A recent article in *Coal Age* stated that it required 33 men to run a coke-oven plant of this size, so it is easy to reckon the wages that might be paid these men per day from the profits derived from distilling the tar. At the present time the movement for good roads is nation wide; and since these roads are constructed so as to withstand heavy traffic and to reduce dust to a minimum, the coal-tar pitch finds a ready sale at good prices and will continue to do so for many years.

To separate the crude materials into more or less refined products is more of a manufacturing business than ordinary coke-oven plants might wish to engage in. Nevertheless, as it has some bearing on the subject, it may be of interest to readers to have a full analysis of the products obtained from the crude fractions of the tar still:

Crude Naphtha (specific gravity, 0.936):	
3 per cent. carbolic and cresylic acids (tar acids)	
2.5 per cent. pyridine bases	
17 per cent. benzole	
17.5 per cent. toluol	
12.5 per cent. solvent naphtha, xylol, etc.	
25 per cent. naphthalene	
Light oil (specific gravity 1.011):	
15.6 per cent. carbolic and cresylic acids	
15 per cent. pressed naphthalene	
Creosote oil (specific gravity, 1.049):	
8.4 per cent. carbolic and cresylic acids	
8 per cent. pressed naphthalene	
Anthracene oil (specific gravity, 1.09):	
16 per cent. pressed anthracene	
Pitch (specific gravity, 1.2):	
This is refined sufficiently for road construction, as it has a twisting point of 55 deg. C.	

It is usually understood that benzole and toluol can be used in gas motors, although they are more powerful than gasoline and go farther; but as long as they are worth more than gasoline, they will not be used for power. A mixture of 10 per cent. benzole and 90 per cent alcohol furnishes gas about equal in power to gasoline.

There are 8,700 byproduct coke ovens in the United States, which possibly coke 87,000 tons of coal per day. This would furnish 261,000 gal. of benzole daily and 870,000 gal. of coal tar. If the coal tar were distilled, the dehydrated tar would furnish 730,000 gal. of pitch, worth \$43,840. This sum represents but part of the value to the country that is wasted by burning tar, for the nitro-compounds of benzole, toluol, naphthalene and phenols, which are derived from the distilled products, are used for explosives.

## Canadian Mining Institute Meeting

The nineteenth annual meeting of the Canadian Mining Institute will be held in Montreal, Quebec, Canada, March 7, 8 and 9, 1917, with headquarters at the Ritz-Carlton Hotel. The election of officers and council for the ensuing term will be held.

Some of the papers that it is expected will be presented for discussion are: Presidential address on "Industrial Preparedness," by Arthur A. Cole; "Organization for Industrial Preparedness," by E. P. Mathewson; "A Plea for the Union of Capital and Labor," by Col. D. Carnegie; "The Amelioration of Industrial Relations," by Dr. David H. Browne; "The Work of the Advisory Council of Scientific and Industrial Research," by Dr. Frank D. Adams; "The Organization of Industrial Research," by Arthur D. Little; "Canada in Relation to the Coal Trade of the Empire," by Allan Greenwell; "Further Notes on Yukon Mining Problems," by Dr. H. M. Payne.

The annual dinner will be held at the Ritz-Carlton Hotel on Thursday evening, March 8.

During the meeting a visit will be made to the munition plants of The Canadian Vickers, Ltd., the Dominion Copper Products Co. and the Montreal Ammunition Co.

## In Our Town

BY WALT MASON

In our small town there is no bar; no booze is sold, in flask or jar; no signs announcing ice-cold beer upon our long main street appear. When we'd assuage our dusty thirst, we quote the motto, "Safety First," and to the nearest hydrant trail, and drink three quarts of Adam's ale. Ten thousand people, good and bad, are dwelling in our lovely grad, and when the week of toil is done, and they set forth to have some fun, not one of all that cheerful throng goes seeking liquor, red and strong; there is no liquor here to seek, and so the seeker'd be a freak. Of course, it makes a strong man groan, to have some money, all his own, and find he cannot blow it in for cool, refreshing square-face gin; and oftentimes, in his despair, he buys his children shoes to wear, or gives his wife a large green bill, which should be in the brewer's till. Or, driven frantic by the law which bars the bugjuice from his maw—a law devised by some fool crank—he puts his money in the bank, or buys himself a house and lot, while he's with indignation hot. The news our papers print is stale; there are no doings at the jail; our people lead eventless lives; our husbands seldom beat their wives; not once a year are prison bunks engaged by plain or fancy drunks. It is a stupid life we lead, and much I fear we'll go to seed; we ought to have a boozing ken, and put our jail in use again!—"Collier's Weekly."

**Errata**—In our issue of Jan. 13, 1917, in the article "Work of the Bureau of Mines," p. 107, the sentence reading: "The quantity of loading was varied from ½ lb. per ft. of entry (0.38 oz. per cu.ft. of air space) to 6 lb. per ft." should read—"0.138 oz. per cu.ft." In the following paragraph where it says: "and strong propagation is obtained with pure pulverized Pittsburgh coal dust loaded at the rate of only 0.3 lb. per ft. of entry (0.83 oz. per cu.ft. of air space)," this should read "0.083 oz. per cu.ft." At the beginning of the next paragraph—"As regards 'superdusting' up to 1 lb." should read "As regards 'superdusting' up to 6 lb."



# How a West Virginia Mine Fire Was Placed Under Control\*

By C. H. TARLETON†

*SYNOPSIS—The problems confronting the rescue and recovery parties at a West Virginia coal-mine fire and the manner in which the difficulties were solved. Whether to reverse the fan, whether to drive gas back over the fire and whether to close off the intake or return were among the problems faced.*

Fires, having many different causes, frequently occur in coal mines. Perhaps the most general cause is electricity. As operations become more extensive, the use of the electric current will become more necessary. As a result the mileage of copper wire will be increased and imperfect insulation will be more likely to occur, so that in all probability the hazard of fire from this source will increase.

Much has been written in mining journals and books about the proper method of controlling mine fires and so many varying opinions have been expressed that a mining man seeking knowledge from them becomes confused, and unless he has some actual experience he will be less fitted to cope with a mine fire after reading such technical literature than he was before.

## ONLY BOOKS SEAL FIRES FIRST ON RETURN

The purpose in presenting this discussion is to clear one point upon which mining men most often disagree, and that is: When it becomes necessary to seal off a mine fire, shall the return or the intake be sealed first? I grant to every man the right to his own opinion, but I believe that most of those who advocate the sealing of the return first have been influenced by information contained in books written before a real mine fire had been under observation.

To get the question before you in concrete form and to have it clearly understood I will give you a description of a fire that recently occurred in one of our large mines. The coal produced by this mine is of the high-volatile gas type. The map is that which was utilized in the instruction of the mine officials of the company at a meeting held soon after the fire.

On Sept. 16, 1916, about 7:40 a.m., notice was received at the main office that a fire had been discovered in the third north section of one of our mines. With a party of other officials I immediately started for the mine and we arrived there at 8:25 a.m.

Because of the many gas wells and the network of gas lines all over the surface and also because of the use of steam in the intake airways for humidifying purposes, practically all the fans of this company are operated as "blowers," thus making the traveling- and haulage-ways the return for the air. However, all the fans are so constructed that the air can be reversed in a few minutes. The fan at this particular mine was supplying 180,000

cu.ft. of air per minute, of which amount 60,500 cu.ft. was returning up the haulway slope and 75,600 cu.ft. up the manway slope, the balance returning at two other openings.

On arriving at the plant, all the inside officials were found to be somewhere in the mine; and it was discovered that the mine telephones were out of service, owing to the falling of the wires. There was therefore no way in which to ascertain the true situation.

A few men were coming up the manway slope; they were in pretty good shape, but they knew nothing more than that there was a fire somewhere.

A few minutes later some lights were observed in the haulway slope. These were seen to fall, showing that the men carrying them were being overcome by the fumes from the fire. As the company's oxygen helmets had not yet arrived, it was necessary to go after these men without such help. Volunteers were not lacking, so all the men were soon brought to the surface and given first-aid treatment. None of these men, however, could be revived in time to furnish information by which the rescue work could be conducted. At that time nothing could be learned from them as to the whereabouts and condition of those known to be in the mine.

A serious situation now confronted us. The smoke and fumes were so strong that the mine could not be entered by the usual routes. To enter by the only other—the intake entry—would serve no useful purpose because it would not be possible to take in any fire-fighting equipment at this point, nor could the main workings be reached by that route. Either the air current had to be reversed or a chance had to be taken that the inside officials would be able to extinguish the fire without help.

## HAD TO REVERSE THE FAN OR DO NOTHING

Action was delayed until it was noted that the fumes were becoming more dense. This indicated that the fire was rapidly increasing in intensity and dispelled the hope that it could be overcome by those in touch with it. A decision to reverse the air was quickly reached, the inside officials being relied on to exercise the necessary intelligence to take care of themselves and of the men with them.

The minute the fan doors were changed, the air reversed. This allowed an exploring party to enter. This party fully expected to find, at the slope bottom, a number of men who had been overcome. But in this they were agreeably disappointed. The exploration continued, and the party reached the intersection of the traveling slope without discovering any one.

While this inspection was being made, the regular fire-fighting crew was prepared and equipped for every emergency. The equipment consisted of a double 60-gal. chemical fire engine and hose, three sets of Draeger oxygen-breathing apparatus and a plentiful supply of brattice cloth, lumber, saws, hatchets and nails. Two doctors volunteered to accompany this party, their assistance being highly appreciated.

\*Extempore address delivered before the West Virginia Coal Mining Institute, Dec. 13, 1916, at Huntington, W. Va.

†Manager, West Virginia division, Consolidation Coal Co., Fairmont, W. Va.



The party had not progressed far when it was met by several men from the inside, who had been stationed at the intersection of the main heading with the third north face. There had been no smoke where they were until the air was reversed. When they noticed its appearance, they started immediately for the outside, experiencing little inconvenience as the air became fresher with every step. These men did not know where the fire was nor what was being done to control it, nor did they know what had happened to the men who were trying to put it out.

The party continued its progress and had almost reached the third north face, when they were elated to meet the men who had been attempting to reach and extinguish the fire. This party was headed by the mine foremen and the firebosses. They were in good condition but rather out of humor because the air had been reversed on them. However, they had thought of this possibility and had laid their plans for it. When, therefore, the smoke came back on them they immediately retreated to the point to which they had planned to escape.

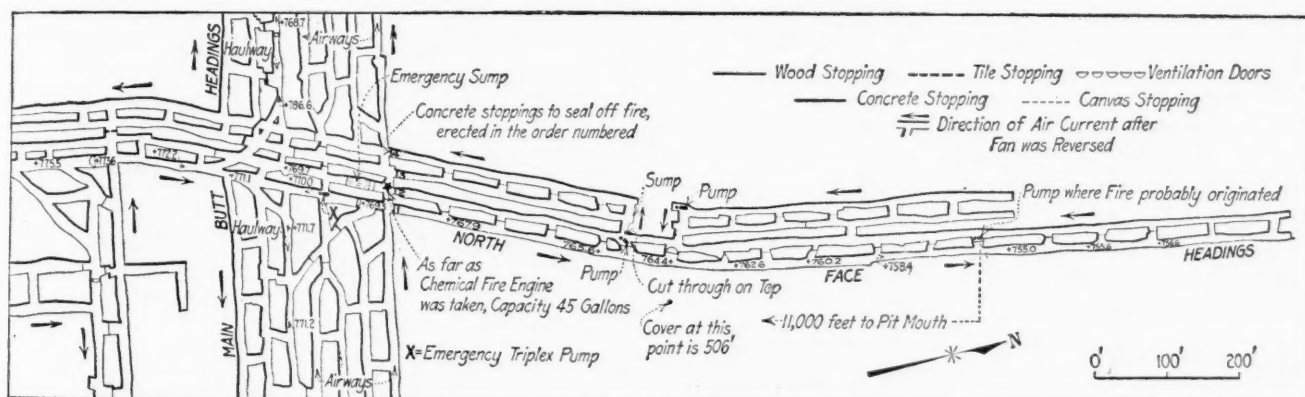
The whole situation was now made plain. When the fire was discovered, runners were immediately dispatched to warn the men to leave. Others secured the 40-gal. chemical fire engine that is always kept on hand at this

order to reach the fire the gas must be driven back over it. However, I and several others in the party had confronted similar conditions before and had overcome them without serious results.

The theory on which we relied was that there was a large amount of blackdamp between this gas and the fire, and that the forcing of this back on the flames would reduce them so much that when the explosive gas reached the blaze it would pass over it without being ignited. We have since been informed by Frank Haas, an eminent authority on mine gases, that in all probability the gas encountered was so intermixed with other damps from the fire that it could not be ignited even if it were passed over the blaze.

It was soon found that the amount of air in circulation—about 25,000 cu.ft. per min.—was not sufficient to move the gas. Arrangements were soon made to double the amount, and, even with this, progress was slow, the party being only able to progress 4000 ft. in 5 hr. At the point thus reached a break was made in a stopping between the haulageway and airway, so that the condition of the return could be ascertained.

The smoke was dense but not hot; therefore, the party considered itself safe in proceeding farther. Progress



MAP SHOWING THE LOCATION OF THE FIRE AND OF THE STOPPINGS BUILT TO CONFINE IT

mine for emergencies. They started for the fire but found it necessary to leave the haulway because of the smoke. They broke a stopping and entered the airway, but progress with the fire engine was slow because of the many roof falls. Consequently, they had not yet reached the fire when the air was reversed. Subsequent events indicated that if they had they would not have been able to extinguish it with the means at hand.

It was now known almost exactly where the fire was located—about 11,000 ft. from the mine opening and about 5000 ft. from the point reached by the party. A plan of procedure was mapped out and a start made down the third north face, which has an average pitch of 1.5 per cent. In cases of this kind a testing crew of two or three careful men is always kept in advance of the main body.

These leaders soon encountered a large body of what was considered explosive gas. This was surprising, for while it was known that this section liberated methane, no such amounts as this had ever been encountered, even after the fan had been idle for a day. The conclusion finally reached was that this gas had been distilled from the coal by the fire and had escaped without burning.

The danger resulting from its presence had a depressing effect upon the whole party, for it was realized that in

from this point was slower even than before on account of several side headings that had to be cleared before they could be passed. Finally all were cleared sufficiently to permit of progress to a point where the fire could be sealed off without losing any of the important sections of the mine. The place selected for sealing was approximately 500 ft. from the point where the fire originated, but judging from the heat and smoke the fire had spread to such a degree that it was now less than half this distance away. To seal it securely four stoppings were required.

We have now arrived at a problem in the work on the solution of which mining men have been differing ever since I have been able to read a mining book or journal. That problem is whether the intake or the return shall be sealed first. No such question so much as occurred to the men on this work. As soon as the order was given to seal off the fire, the men commenced. It was not necessary to tell them where to start, for there was but one possible place, and that was the intake heading leading to the fire.

I am of the opinion that if all the men who have advocated the sealing of the return first had been present and had noted the actual conditions and had contemplated just what would happen to the workmen the minute the

return was even partially closed, there would no longer be the difference of opinion that now prevails.

The work of sealing progressed rapidly. The erection of a stopping in the intake heading was easily accomplished. A canvas stopping was first erected, then against this a plank stopping was built of sufficient strength to permit of the construction of a concrete wall against it later on. An observer would have noted that before the wood-and-canvas stopping was completed the smoke and fumes were backed up against it, and he would realize that unless it was made very tight before the stoppings on the returns were built the fumes would back through and overcome the men. Even after the stoppings had been made as tight as possible enough leakage occurred to make several of the men sick.

The sealing of the return is an extremely difficult proposition, even after the intake has been closed, to say nothing of attempting it with the intake still open. In this case I do not believe it would have been possible to close the return first even aided by the use of oxygen helmets, for the smoke was so dense that men would not have been able to see how to work.

Some work was attempted with the helmets at this, as at other fires, but we found that men can do but little hard labor with them on. I am of the opinion that they do not have much value except for exploring short distances ahead of the ventilation, erecting light stoppings, using fire extinguishers and staying close enough to a fire to direct a stream of water or chemical into it from a hose nozzle. If much more than that is attempted, the wearer takes grave chances on losing his life.

#### THREE RETURN STOPPINGS HAD TO BE BUILT

As already stated, four stoppings were needed for the effectual sealing of this fire. These stoppings are numbered on the draft, Nos. 1, 2, 3 and 4. No. 1 being on the intake was an easy proposition; Nos. 2 and 3 were almost as easy because all the smoke and gases were readily driven to the airway or airways that remained open. To complete No. 4 stopping required all the available air and all the force at hand. Some of the work required the men to go so near the smoke that a man could work only a few minutes at a time. Finally all the stoppings were closed and carefully plastered.

The work of placing concrete against the wood was now started and continued until all the stoppings were completed and absolutely tight. A pipe with valve attached was placed in No. 1 stopping, to permit the pumping of water through the wall to flood the fire area. A smaller pipe with valve attached was placed in stopping No. 2 for observation purposes and to relieve any excessive pressure in the confined area. This pressure was relieved each night. The gas coming out after the first 24 hr. was mainly methane, and its presence was easily detected with a safety lamp held three or four feet from the opening.

The origin of the fire has not been definitely determined, but it is presumed that it was caused by defective wiring at or near a small pump station.

The reason usually advanced for sealing the return side of a mine fire first is that this precaution renders the possibility of an explosion in the fire area almost nil, while if the intake is sealed first an explosion is almost certain. I am of the opinion that the conditions in the fire area are exactly the same, regardless of the side which

is sealed first. The sealing of either side stops the air from making the usual circuit; consequently, the smoke and gases soon fill both headings to the point where the air has been short-circuited to permit of the sealing.

That there is danger of an explosion in the fire area is conceded, but that the danger is any more imminent when the intake is sealed first is denied. The experience at this fire, as well as at many others, suggests the possibility that men who advocate the sealing of the return first have never been "up against" a real mine fire.

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### Drift Mouth at Stotesbury, W. Va.

The accompanying illustration shows the drift mouth recently completed at East Five Mine of the E. E. White Coal Co. at Stotesbury, W. Va.

The abutments, arch, face wall and wing walls are all of native gray sandstone, quarried within 100 ft. of the



MASONRY MINE MOUTH AT E. E. WHITE COAL CO.'S MINE, STOTESBURY, W. VA.

drift mouth, laid in regular range and cement pointed. Permanent construction is here combined with beauty, the combination that has long since won for the E. E. White Coal Co. a place among West Virginia's progressive coal-mining operations.

The illustration also shows a party of the company's directors during a recent inspection of its plants at Stotesbury and Glen White.

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### Large Outputs from Gillespie Shafts

The leading producers in Illinois are the shafts of the Superior Coal Co. at Gillespie, Ill. The tonnages, the days worked and the average daily productions in 1916 are recorded below.

	Mine Tonnage	Days Worked	Average per Day
No. 1.....	840,953	221½	3,799
No. 2.....	912,814	209½	4,355
No. 3.....	1,023,753	232½	4,403
Totals and averages.....	2,777,520	221	12,558

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**The Determination of the Moisture in Coal** delivered from stock piles is often of great importance, for the proportion of moisture contained in the small sizes, which are most abundant near the center of a stock pile and which absorb the rains and melting snows, may be from 10 to 15 per cent. higher than when stocked. It is apparent, therefore, that special determinations for moisture are necessary for the equitable adjustment of payment on account of the excessive moisture in coal which is stocked in piles exposed to the weather.



# New Power Plant of the Susquehanna Coal Co.

BY C. H. BEIDENMILLER\*

**SYNOPSIS**—A 5,000-hp. boiler plant is under construction and is now nearly completed. Chain grate stokers and forced draft are employed. Only a water tender and two firemen are needed to operate this plant, as the fuel is not touched by the human hand or hand-operated tool from the time it is loaded in the mine to when it is flushed back underground as ashes.

A new power plant at the No. 7 colliery of the Susquehanna Coal Co., Nanticoke, Penn., is now under construction in which officials and employees of the company feel a just pride. The boiler house is situated about 400 ft. from the No. 7 breaker and 1,100 ft. from No. 1 shaft, which is the principal opening in its vicinity.

Erection of the boiler house was begun in May, 1914. This building, housing ten batteries of boilers, 500 hp. to the battery, is 186 ft. long and 94 ft. wide. The center line of stacks is 6 ft. outside the building proper. There are in all ten stacks, each 5 ft. in diameter and 100 ft. high. These are placed upon masonry foundations, 9½ ft. square, the tops of which at some points

The foundation of the boiler settings is of concrete construction of a 1:2½:5 mixture, resting on a sub-base 2 ft. thick. This foundation incloses the air duct, flue-dust pits and ashpits, also the ash conveyor trough.

Six of the ten batteries of boilers are now completed and supplying steam to various points about the colliery. The construction of this plant has already dispensed with four small boiler plants, and when completed five more settings aggregating 2,500 hp. will be dismantled at the No. 5 colliery boiler house. Besides these various boiler houses being dismantled, there have been seven batteries, aggregating 3,000 hp., removed from the old No. 7 colliery boiler house. These were all hand-fired plants.

The batteries of boilers are placed upon either side of the boiler house, there being five batteries on a side. Each battery is composed of two units of 250 hp. each. Babcock & Wilcox boilers are employed, each unit consisting of two drums, 31½ ft. in diameter and 24 ft. long, each drum having attached fifty-six 4-in. tubes. Each boiler is equipped with the usual appurtenances, including a coal meter and a flow meter of the General Electric Co. type. The safety valves are set to operate at 150 lb. gage pressure, which pressure will be carried regularly.

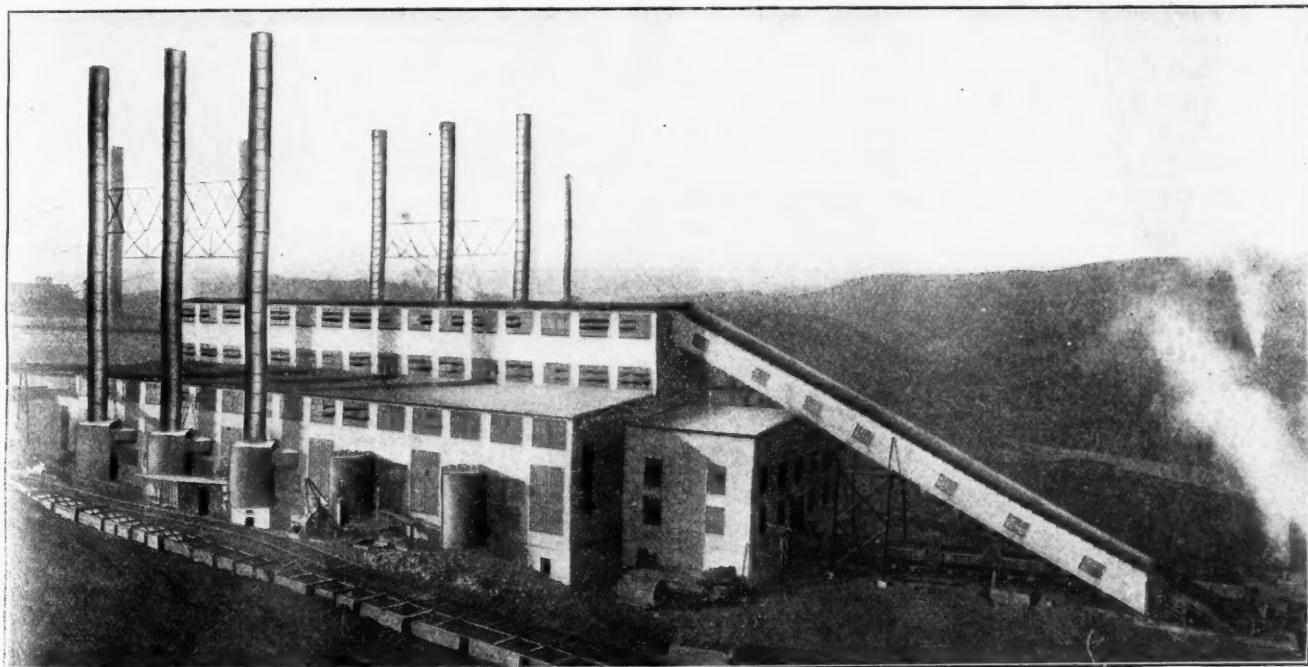


FIG. 1. GENERAL VIEW OF THE PLANT, SHOWING ELEVATING FUEL CONVEYOR TO THE RIGHT

are 22 ft. above the ground level. Attached to the north end of the house is an addition, 52x32 ft., in which the fans and engines for driving the auxiliary machinery will be placed.

The boiler house is well lighted by glazed windows, the total lighting area being approximately 30 per cent. of the area of the sides of the building. The structure is fireproof, the framework being of steel and the roof and sides of No. 20 gage Hy-rib covered with a coating of plaster. The floor is of concrete poured over Hy-rib resting on H-beams supported by the boiler foundations.

All the boilers will be stoked mechanically, it being possible to operate the entire plant with three men—a water tender and two firemen. The Coxe traveling chain grate stoker is used in all settings. This grate has a surface of 90 sq.ft., being 9 ft. wide and 10 ft. long. It moves at a speed of 12 to 23 ft. per hour.

Each grate is composed of 48 to 50 grate bars, each provided with 130 movable parts, locally known as "piano keys." These keys may be replaced easily when broken. The air space of the grate amounts to about 5 per cent. of its area. At either side the grate bars are attached to an inside-drive link chain, to which motion is im-

\*408 Carey Ave., Wilkes-Barre, Penn.



parted by a sprocket wheel at the rear end of the grate. Two tail sheaves over which the grate passes are placed at the back end of the firebox.

Motion to the sprocket wheel is transmitted from a  $3\frac{3}{8}$ -in. driving shaft extending the entire length of the building and placed in the rear of the settings (one shaft at either side of the house) through two cone-pulley reduction gears, shaft, worm gear and spurwheel. The driving shaft runs at a speed of 100 r.p.m. The gearing reduction is about 1,400 to 1. This can be varied by means of the cone pulleys.

The boilers are operated under forced draft applied at present by two 9-ft. fans. When the plant is completed, however, the draft will be furnished by two fans of small diameter, to be placed in the addition at the north end of the house. Air is carried from the fans through a tunnel 13 ft. 4 in. by 7 ft. in dimensions, and is admitted to the firebox under a water gage of approximately  $1\frac{1}{2}$  in.

The air is carried from the main tunnel, which is below the boiler-room floor level between the two rows of settings through air ducts in the concrete foundation of each boiler setting to a point beneath the grate. Here its pressure is regulated to suit fire conditions. Two sets of levers, of three levers each, are provided for this purpose, one set at the front and the other at the rear of the grate. The coal used is of the size known as buckwheat No. 3.

The coal for firing is at present conveyed in side-dump cars to the boot of a conveyor at the north end of the boiler house. From this point it is elevated to a bin running the entire length of the building and located halfway between the boilers, and at an elevation of 19 ft. above the grate level. Holes in the bottom of the conveyor trough permit the discharge of the coal into the bin at various points. When it is desired to stop the

delivery of coal to any particular part of the bin, these holes are closed by means of slides.

When the construction of a proposed breaker is completed, it is the intention to have coal conveyed from this breaker, which will be about 600 ft. away, by a conveyor line and discharged on a pile near the boot of the present conveyor employed for elevating the fuel to the bin. This coal will be gathered from the pile by a Dodge reloader and delivered to the boot of the present conveyor. From here it will be elevated to the bin.

Coal is fed to the grates from the bin, or bunker, situated overhead in the center of the boiler house. The rate of flow to the grates is regulated by a gate placed over the feed hopper at the front of the setting. This is adjusted by means of a wheel operating a gear and rack bar.

The coal is fed in at the front of the setting and is carried through the furnace by the moving grate, which discharges into the ashpit at the rear end. The speed of the grate is so regulated that the combustion of the coal is complete. The flue-dust pit is connected to the ashpit, the opening being covered by a sliding door which is operated by a lever alongside the boiler setting on the boiler-house floor level.

The ashes are retained in the ashpit by means of a vertical sliding door, operated by a lever on a lineshaft which runs the entire length of the setting. Ashes from the various ashpits are discharged into two conveyor lines, one upon either side of the house, and extending the entire length of the building. Water in the ashpit is maintained about 6 in. above the lowest point.

The ashes received in the conveyor troughs, which are covered by cast-iron plates 2 ft. long, are discharged by conveyor lines composed of 9-in. pitch 40 per cent. carbon steel outside-drive simplex chain fitted with  $2\frac{1}{2}$  x  $8\frac{1}{2}$  x  $\frac{3}{8}$ -in. steel flights to a common trough at the end of

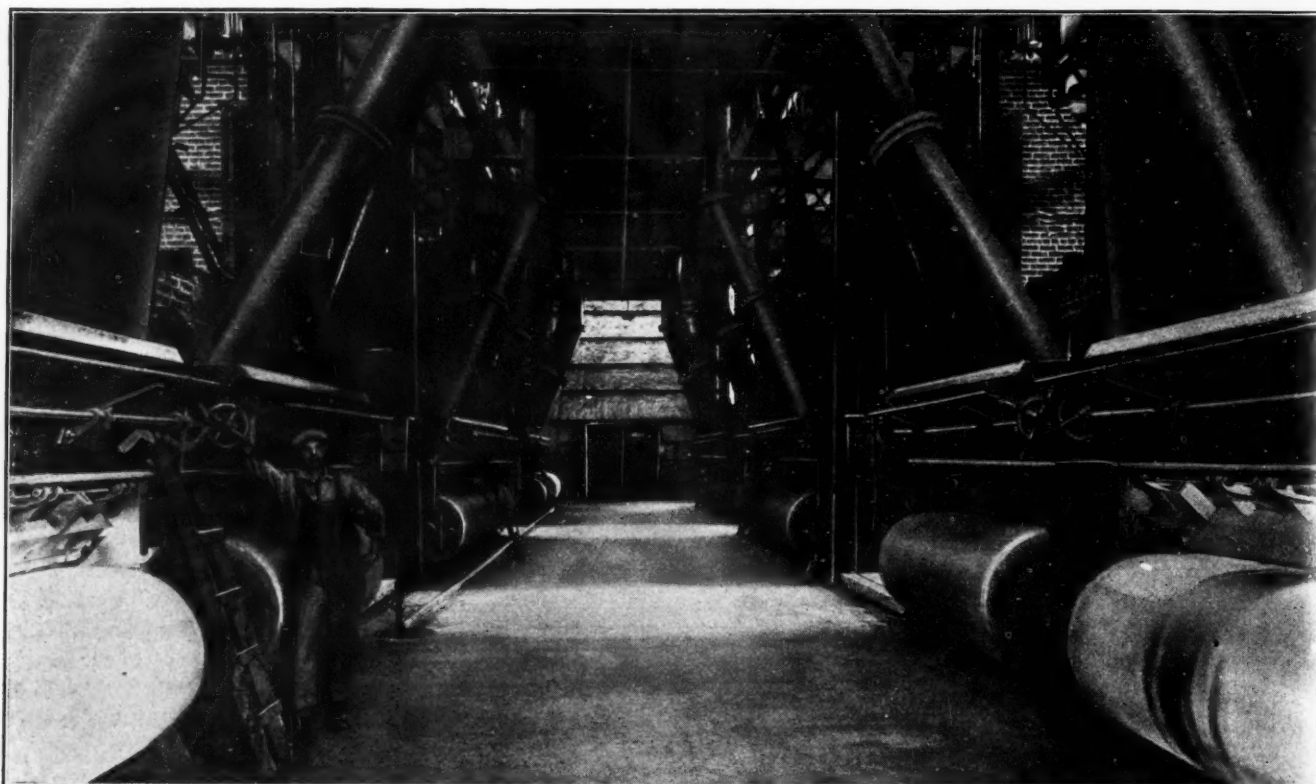


FIG. 2. FIRING ALLEY BETWEEN BOILERS, SHOWING OVERHEAD BUNKER, DOWNCOMER PIPES, FUEL HOPPERS AND FRONT OF STOKERS

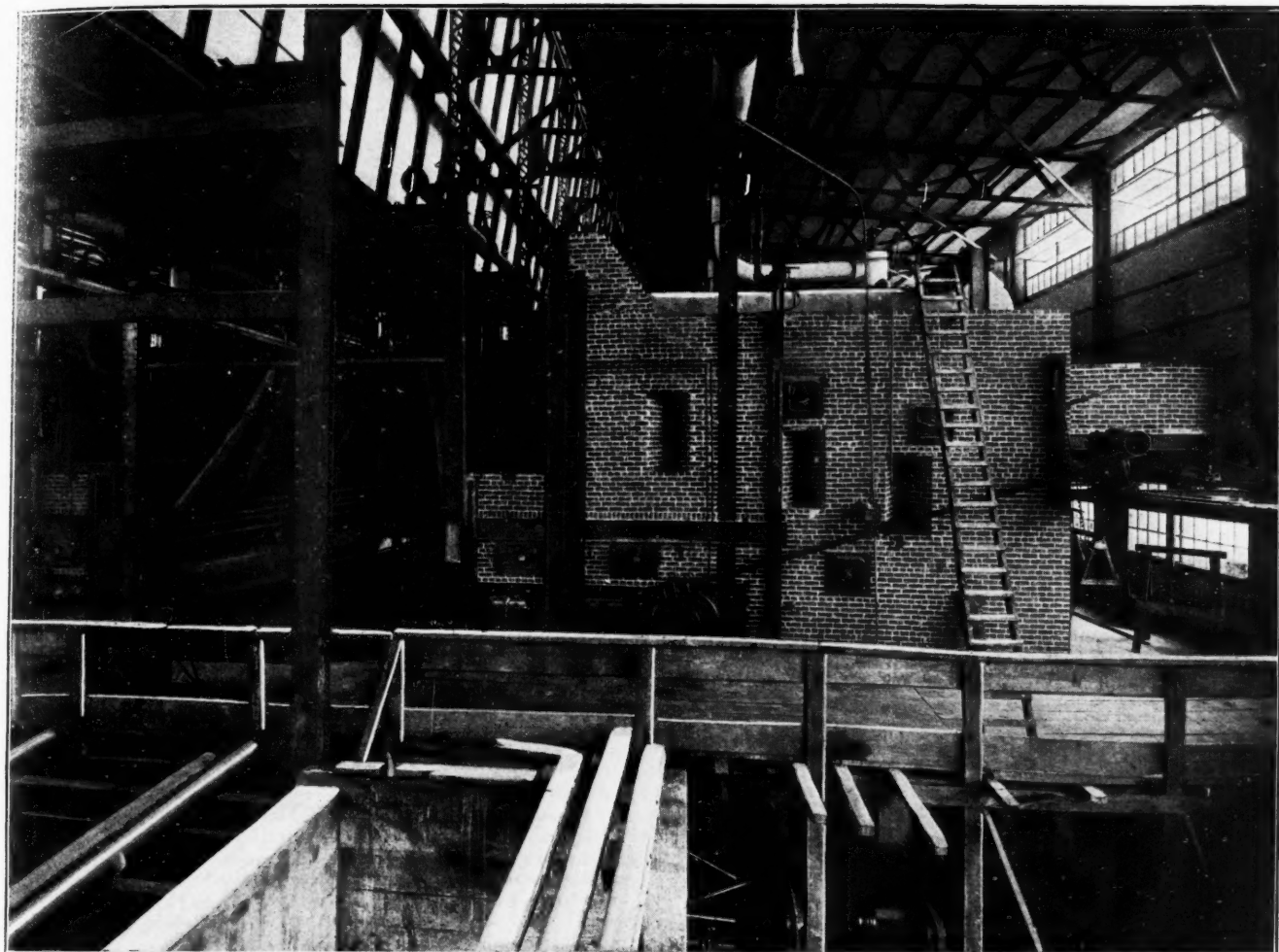


FIG. 3. SIDE VIEW OF A BOILER SETTING; ONE CONE PULLEY AND THE SHAFT DRIVING THE STOKER ARE VISIBLE

the boiler house. From here the ashes, after a sufficient amount of water is added, flow by gravity to a settling tank about 450 ft. from the boiler house.

From this tank the ashes may be conducted directly into the mines by means of a culm borehole near-by, or they may be elevated by a conveyor line to a hopper, from which they may be loaded into dump-cars for use as ballast, making fills or other purposes.

A unique feature of this plant is the fact that neither the human hand nor instruments held therein need touch the coal from the time it is loaded in the mine to the time when it is again unloaded or discharged in the mine as ashes.

Power for driving the coal- and ash-conveyor lines, and also the traveling grates, is furnished by a 14½x30-in. engine made by C. & G. Cooper, of Mt. Vernon, Ohio. This is a four-valve machine operating under a steam pressure of 125 lb. and developing 250 hp. The power is transmitted by belt to gearing located in the cellar, 8 ft. below the floor level. From here the ash conveyors are driven by means of a clutch, enabling each conveyor to be operated at will.

Power for the coal conveyor is transmitted to gears on the upper floor level of the boiler house at the top of the coal bin by 1½-in. hemp transmission rope. This conveyor is also operated by a clutch. The line shafting on each side of the house is driven by belt from the gears in the cellar, while power is transmitted to the traveling grates by means of cone pulleys, as before men-

tioned. When the plant is completed power will be furnished by two engines, so as to prevent a shutdown of the plant in case of accident to either of the machines.

The feed water for the boilers is obtained from mountain springs. It is stored in a reservoir 1,700 ft. from the feed-water heater, which is of the open type. This water was formerly treated with sodium carbonate and hydrates, but recently has been supplied to the boilers raw. The water scales slightly, and there is a mud incrustation which sticks fast to the sides of the boiler and the tubes. The water is delivered to the boilers by a centrifugal pump driven by a steam turbine built by the Kerr Turbine Co.

Steam from the boilers is transmitted by four main trunk lines. These extend toward No. 8 shaft by an 8-in. diameter pipe 4,275 ft. in length; toward No. 1 shaft by a 12-in. pipe 1,000 ft. long; toward the washery by a 6-in. pipe 1,100 ft. long; and toward No. 5 colliery by a 15-in. line 3,400 ft. long. From the latter trunk line, at a point 2,100 ft. from the boilers, a 5-in. line is extended 2,800 ft. toward No. 1 slope.

Branches are taken from the trunk line to the various engines, the arrangement being such that all the steam-operated machines at the two collieries, Nos. 5 and 7, with the exception of one pair of dirt-plane engines and one ventilating fan, will receive the steam for their operation from the one plant.

The various pipe lines are covered with three layers of asbestos each ¾ in. thick and three layers of rosinized



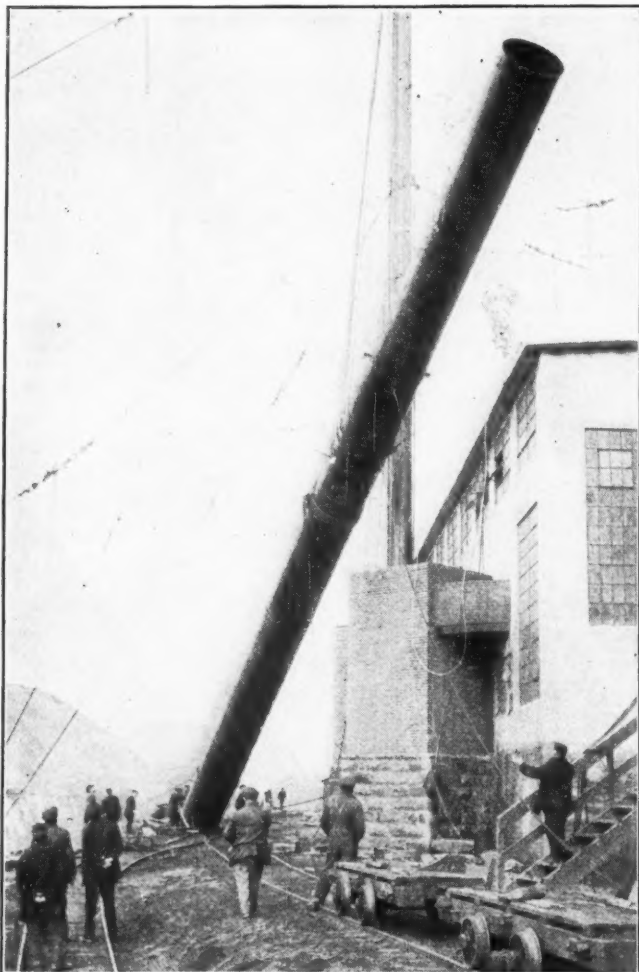


FIG. 4. HOISTING THE FIRST STACK INTO POSITION

paper, over the outside of which is placed one layer of four-ply asbestos roofing. The trunk lines in the house are covered with one layer of standard 85 per cent. magnesia sectional covering  $1\frac{1}{4}$  in. thick and one coat of asbestos cement  $\frac{3}{4}$  in. thick. The trunk lines are equipped with Wyoming eliminators of the horizontal type and Wyoming piston-operated steam flood traps.

### Goethals on the Coal Situation at the Panama Canal

In a speech before the Merchants' Association of New York on Dec. 20, Major-General Goethals summarized the Government's attitude on coal marketing at the Panama Canal as follows:

The sale of coal, or the importation of coal under the Taft agreement, is specifically exempted from taxation. That gave us the idea of extending the coaling plants, increasing that on the Atlantic side to about four times the capacity required by the Navy and three times the amount of space required by the Navy on the Pacific side, and allowing private industries to come into the zone for the sale of coal. Our coaling plants are completed and in operation and we have advertised the fact broadcast that we are ready to lease lands for the benefit of coal dealers who desire to enter the coal business on the Zone.

War conditions have prevented anything of the kind being done. In order that the outsider might be able to compete with the United States in its coal transactions, we are going to lease land for a certain sum, and we will handle their coal by our coaling plant to and from ships for a certain sum. The cost of our own coal will be increased by these amounts and we will then add 25 per cent. profit, so that there is no reason why outside companies should not lease space for coal and sell to the shipping trade.

We have been unable thus far to keep up with the demand, and last year we profited to the extent of \$360,000, though we were selling coal at \$6.50 per ton, whereas in the adjacent islands coal was being sold at the rate of \$24 per ton. We were obliged to confine our sales of coal to the ships using the Canal, excluding from its advantages all ships which merely touched at the Canal for the benefit of getting our coal.

## RECENT LEGAL DECISIONS

**Duty To Warn Coal-Cutting Machine Operators**—Although a coal operator is under no legal obligation to warn an employee against obvious dangers, an inexperienced man set at work operating a coal-cutting machine is entitled to warning against such dangers incident to its operation as are not plainly apparent. (Pennsylvania Supreme Court, *Roszina vs. Howard Gas Coal Co.*, 96 Atlantic Reporter, 716.)

**Excessiveness of Award for Electric Shock**—A verdict for \$2,000 for electric shock sustained by a mine employee is so grossly excessive as to require a new trial when it appears that he was able to return to work the same day and that his incapacity commencing three days later was due to rheumatism and malaria. (Kentucky Court of Appeals, *Neff vs. Imperial Jellico Coal Co.*, 179 Southwestern Reporter, 829.)

**Liability for Injury to Subemployees**—Whether a coal company is liable for injury to a man engaged in assisting in clearing timber from the surface under a contract between the company and a third person depends upon whether such third person was an "independent contractor" or a mere employee subject to control by the company. If it was a case of independent contractor, the mining company is not liable. (Kentucky Court of Appeals, *Howard vs. Carter Coal Co.*, 183 Southwestern Reporter, 244.)

**Pennsylvania Requirement Concerning Shelter Holes**—The requirement under the Pennsylvania laws that shelter holes shall be provided on all main hauling roads in bituminous coal mines on which hauling is done by machinery applies to all such roads without regard to width. The mine owner is not relieved from liability for injury resulting to a miner through failure to comply with this law, although the duty is devolved by the law upon the mine foreman to see that such holes are cut. (United States Circuit Court of Appeals, Third Circuit, *Vozar vs. Barnes & Tucker Coal Co.*, 227 Federal Reporter, 25.)

**Pollution of Water in Mining Operations**—When pollution of water in mining operations constitutes a public nuisance, as distinguished from a condition in which only one or a few persons are affected and in a private way, right to continue it cannot be claimed by reason of the fact that the condition has continued for years without complaint. But one who allows a mine operator to maintain a private nuisance by using, polluting, or diverting water for ten years or more without objection is precluded from recovering damages growing out of such conditions. (Alabama Supreme Court, *Ballard vs. Stouts Mountain Coal and Coke Co.*, 70 Southern Reporter, 172.)

**Phases of Employment Contracts**—A contract employing a mine superintendent or other officer or employee for a year or more is not enforceable for the agreed term unless reduced to writing. An employee who accepts employment in accordance with the terms of a writing is bound by those terms whether he reads them or not. When a contract of employment is indefinite as to duration, it may be terminated at any time, and cannot be sustained on the theory of an existing custom that a contract indefinite as to duration shall continue in force at least one year. (Kentucky Court of Appeals, *Bowen vs. Chenoa-Hignite Coal Co.*, 182 Southwestern Reporter, 635.)

**Effect of Fraud on Contract Rights**—In a suit on a note given as part of the purchase price of a coal brokerage business, defended on the ground that misrepresentations were made to the defendant buyer as to the value of the assets of the enterprise assigned to him, it is held that to constitute actionable fraud, it must be made to appear: (1) That the misrepresentation related to a material fact, (2) was known by the person making it to be false, or was recklessly made, (3) was made as an inducement to the other party to enter into the contract, (4) was so acted upon innocently by such other party, (5) to his injury. A contract induced through fraud is not void, being merely voidable; and if once ratified by the other party with knowledge of the fraud cannot afterward be set aside on account of such fraud. (Oklahoma Supreme Court, *Wingate vs. Render*, 160 Pacific Reporter, 614.)

# The Labor Situation

## General Labor Review

On Jan. 25 Representative John J. Casey, of Pennsylvania, introduced a resolution in Congress authorizing the Department of Labor to make an inquiry into the wages, hours and conditions of labor in the coal-mining industry. He also introduced a resolution appropriating \$25,000 for the investigation.

The United States Senate by a vote of 62 to 19 on Feb. 5 repassed the immigration bill requiring that all aliens admitted to the United States who are physically capable of reading shall be able to read the English or some other language or dialect, including Hebrew or Yiddish. The law provides that any admissible alien or any citizen of the United States may bring in or send for his father or grandfather over 55 years of age, his wife, mother, grandmother or unmarried or widowed daughter, if otherwise admissible, regardless of whether such relatives can read.

### Illiterate Aliens Are Now To Be Excluded

The law permits immigration officials to exempt from the operation of the test foreigners who in their judgment are fleeing from religious persecution. It provides also that "no alien now in any way excluded from or prevented from entering the United States shall be admitted to the United States."

The law goes into effect on May 1. The bill was first introduced in 1897. It passed both houses and was vetoed by President Cleveland; then it was passed again and presented to President Taft for signature; he also vetoed it. On two occasions the bill has been presented to President Wilson and each time he returned it with his veto. This time it was repassed with a two-thirds majority in each house. The House of Representatives reaffirmed its decision last week by a vote of 287 to 106. Immediately following the action of the Senate, A. P. Gardner, a Representative from Massachusetts, introduced a bill limiting the number of aliens coming into the United States to a total of 200,000 a year in excess of the outgoing aliens.

### Election Returns Show White Is Re-elected

The headquarters of the International Committee of the United Mine Workers of America has just announced the result of the vote for international officers. President White is re-elected, receiving 101,529½ votes as against 92,953½ votes cast for John H. Walker, of Danville, Ill. Frank J. Hayes, of Indianapolis, succeeds himself as vice-president without opposition, and William Green, of Coshocton, Ohio, retains the office of secretary-treasurer, defeating J. L. Sims, of Linton, Ind., by 128,168½ votes to 56,493½.

The delegates to the American Federation of Labor will consist of the three officials thus chosen and five others, John H. Walker; Duncan McDonald, of Springfield, Ill.; John Mitchell, of Mount Vernon, N. Y., former president of the United Mine Workers of America; Frank Farrington, of Streator, Ill., and John Moore, of Columbus, Ohio.

### Still Button Striking in Hard-Coal Region

Despite the disapproval of the Anthracite Conciliation Board, button strikes still continue. They are plainly against the contract. No diligent twisting of the terms of the agreement can make button or any other strikes within the contract period lawful. But they continue. This time it was 800 men working for the Susquehanna Coal Co., at Green Ridge colliery, who suspended operations. The strike commenced on Feb. 3, and the mine workers declared that they would stay idle till every man was coerced into paying his dues to the union. As large a body of men in the Locust Spring colliery of the Philadelphia & Reading Coal and Iron Co. quit work on the same day for the same reason.

Possibly the decision of the Lehigh Coal and Navigation Co. mine workers to stay at their work for 8 hr. on Saturdays, as stated in last week's issue, was not made quite plain. The company had objected to the establishment of a half-holiday on Saturday, which holiday was a violation of the contract. The men instead of working 48 hr. worked only 45. By lengthening the working day half an hour for five days in the week the company would have gained 2½ working hours and

could have afforded to concede the half holiday, but the mine workers preferred the 8-hr. day for six days in the week to an 8½-hr. day for five days and a short day on Saturday.

The case of the Coal Operators' Association of Central Pennsylvania against the Moshannon Coal Mining Co. was continued on application of Attorney Forsythe, of the association, from Jan. 29, the date on which it was scheduled to come up, till Feb. 1. The association desires to prevent the Moshannon Coal Mining Co. from increasing its wages above the amount provided in the bonus granted by the association.

### Judge Ruppel's Decision Will Not Be Appealed

In the Somerset region the mine workers' officials have consulted with their attorneys and are now said to be convinced that there is no redress from the decision of Judge Ruppel. Nine have paid fines of \$50 each with costs and three have paid fines of \$75. It is reported that the fines were paid out of the treasury of the union.

The strike of the miners at the Althouse plant of the Consolidation Coal Co., near Garrett in Somerset County, has been adjusted, and the plant has resumed operations after an idleness of several months. The Blair-Cambria Coal Co., of Dougherty, Penn., in Cambria County, has given its 200 mine workers a bonus of 10 per cent. As the report appears in the papers it reads a "bonus of 10 per cent. of the earnings of the corporation," which is probably incorrect.

Reference to the "Labor Situation" in the issue of Jan. 27 will show that the operators of the New River and Loup Creek fields, in West Virginia, on Jan. 16 granted an increase to their mine workers which is to date from Mar. 1 of this year. This was not a bonus apparently, but an increase in rates.

### And Now the Cabin Creek Region Gets a Bonus

On Jan. 31 the operators of Cabin Creek, Big Coal River and Horse Creek posted notices that they would pay a 10 per cent. bonus to their mine workers. The increase will be effective at the mines of the Cabin Creek Consolidated Coal Co., the Carbon Coal Co., the Wyatt Coal Co., the Coalburg Collieries Co. and the Don Coal Co., all on Cabin Creek. The Coal River operators include the Anchor Coal Co., the Seng Creek Coal Co., the Webb Fuel Co., the Clear Fork Coal Co. and the Marsh Fork Coal Co. The bonus will be paid to between 4000 and 5000 mine workers.

The mine workers at the Kirk-Dunn Coal Co.'s mine at West Point, in Columbiana County, in the northern end of the Ohio coal field, have gone on strike about the discharge of a mule driver. As a result 200 men are idle.

The mine workers in many parts of Illinois have been trying to obtain bonuses or increases from the operators, basing their claim on the high prices of coal now prevailing. According to reports received at the office of the state organization at Springfield, the effort has failed in practically every instance, the operators holding the men to their contract. The secretary-treasurer, Duncan McDonald, declares that the operators are making on an average \$1 per ton more than at a corresponding time last year, though the wage increase paid to the miners is only 3c. per ton.

### Illinois Officials Forbid Vote on New Scale

The executive board of the United Mine Workers in Illinois, however, voted solidly against the request of the LaSalle and Spring Valley mine workers for a referendum vote to rescind the machine scale of wages. At a meeting in Springfield the board gave two votes to one against such a referendum. The board held itself bound to the joint agreement. The miners claim that under the machine scale they cannot earn as much as with hand mining, which is probably quite true, for there is no longer any hand mining properly so called. The miners let the powder do the work. The differential when established did not contemplate that method of mining, and in most of the regions of other states it is still not allowed, as the practice is dangerous.

At the Peoples Mining Co.'s mine at Henderson, or Weaver-ton, Ky., a strike has been forestalled. The mine is small, about 45 men being employed. Wright Walker, the superintendent, laid off Chris Annis, a miner, aged 71 years, on account of his age, and the mine workers resented the action. He was permitted to return to work.



On Feb. 5 the United States Supreme Court refused to interfere with the trial of the case between the Bache-Denman coal interests and the United Mine Workers of America. This is, as will be remembered, a suit for three times the damages sustained by the plaintiffs at the hands of the mine workers' union. The mine workers also sought to have the trial of the case put in the hands of some one other than Frank A. Youmans. They failed also to obtain this writ of prohibition.

The difficulty in Canada is still not entirely settled, but the men are back at work. There have been strikes at Frank, Michel, Hillcrest, Coalhurst and Chinook in the Crowsnest Pass field, 2000 men being idle. However, 1000 men at Bellevue, Coleman and Carbondale continued at work. At a special meeting on June 22 two to one were in favor of not working, but eventually the mine workers concluded their desultory strike of two weeks' duration and returned to the mines.

Thomas Crothers, Minister of Labor, left Ottawa for the West, Jan. 25, in order to confer with the men, and he is now at Calgary. The miners who asked for a 25 per cent. increase now seem likely to accept 9½ per cent., that percentage having been determined by the Government to represent the increased cost of living since the previous readjustment.

The daily wages in District 18 under the present scale are as follows:

Contract miners (average daily earnings)	\$5.13
Laborers working outside mine	2.75
Tippelmen	2.89
Carpenters	4.10
Blacksmiths	4.10
Machinists	\$3.65 to 4.10
Firemen	3.18 to 4.10
Engineers	3.45 to 4.65
Teamsters	3.18
Laborers in the mine	3.03 to 3.75

Due to the strike the coal shortage in the prairie provinces has become acute, and the smelters at Trail, B. C., busily engaged on war contracts, have hardly enough fuel to keep them running

## New Contract-Labor Dispute

The miners at mines Nos. 1 and 2 and at the Boston collieries of the Delaware and Hudson Co. called a strike on Feb. 1, urging that under the decision of Charles P. Neill, the umpire of the Conciliation Board, all contract mining was abolished. About 2500 miners were idle as a result. On Feb. 2 the company and its employees came to an agreement and the men went back to work.

It is said that since the order became effective the company's officials have not only failed to cancel the old contract, but have negotiated new ones in direct violation of the decision.

## Some More Election Returns

In District No. 17, which includes almost all of West Virginia, a committee has submitted the final returns for the election of Dec. 12, 1916. C. F. Keeney, of Eskdale, received 1152 votes for president and so defeated the other contestants, who were F. G. Stanley, of Shrewsbury, 868 votes; Thomas Cairns, of Charleston, 538 votes; J. L. Ballard, of Cannelton, 503 votes, and C. C. Griffith, of Charleston, 413 votes.

William Petry, of Boomer, with 1100 votes, becomes vice-president; Fred Mooney, of Olcott, who opposed a large field, becomes secretary-treasurer, having only 655 votes. The international board member is Pat F. Gatens, of Bancroft.

The official count of the ballots cast in the recent United Mine Workers' election in Illinois shows that Frank Farrington, of Streator, is president, with 26,024 votes. Frank Heflerly, of Collinsville, received 14,591, although he announced his withdrawal before the election, and James W. Murray, of Westville, received 16,255. Harry Fishwick, of Springfield, was elected vice-president. Walter Nesbit, of Belleville, was elected secretary-treasurer, receiving 29,757 votes, to the 26,481 cast for Duncan McDonald, who had held the office 14 years. Farrington says his reelection is a vindication of the charges brought against him at the recent Peoria convention when an attempt was made to impeach him. McDonald has issued a statement calling attention to the fact that he received a larger vote than Farrington and blaming Farrington and the "political gang" in the organization for his defeat.

The returns from District No. 5, western Pennsylvania, show that Philip Murray, of Ivanhoe, Washington County, Pennsylvania, is president of his district with 15,288 votes. The vice-president will be Robert R. Gibbons, of Moon Run, who received 10,309 votes; the secretary-treasurer is William Hargest, of Monongahela, who obtained 10,952 votes, and the international board member is John O'Leary, of Roscoe.

## Conciliation Board Decisions

The Anthracite Conciliation Board on Jan. 29 held hearings regarding four grievances at anthracite collieries. These exhibit the character of the matters usually brought before the court. It will be noted that they are all grievances against the coal companies.

The companies have their grievances also, but they no longer present them to the conciliation board, for what is the use? If they get a decision by which, for instance, it is declared that button or other strikes are against the contract, what good does it do them? The court is utterly unable to do anything. The mine workers take the law in their own hands and disregard the board at their pleasure, but the coal companies obey the decisions of the board, however little they may approve of them. The United Mine Workers of America says that it is not incorporated and that it cannot be held to its agreements, but it is doubtful whether it would hold that the operator should therefore be allowed to escape his legal responsibility in case of a violation of the finding of the board on the part of the coal company.

It is a poor rule that does not work both ways. The officers of the United Mine Workers of America undoubtedly believe it should, but so far they have been entirely unable to put their convictions into practice. So the operators do not know that there is any board in existence to give them justice. They know that such a board is sitting to give their men what they bargained for—and sometimes far more—but there is no one to see that what has been promised to the operator will be carried out.

### A Board Only Backed by Moral Force Is Useless

The board has found that its power is not backed by public sentiment nor by any force but the conscience and responsibility of those brought before the tribunal. If that conscience or that prudence is sufficiently keen to coerce the parties, as it has invariably proved with the operators, then the board has force; if the law-abiding sense fails to be of the required strength, as it has proved repeatedly with the rank and file of the mine workers, then the tribunal is a weak and ineffectual instrument of justice. Like some of our arbitration treaties and our Hague tribunal undertakings, it is found that contracts bind the law abiding in uncomfortable fetters and leave those who pride themselves on being above such restraint free to do as they please. In short, the conciliation board is a watch dog without teeth, as far as one party to the contract is concerned.

One case presented on Jan. 29 concerned William Stoneham, the former slope engineer at the Louise colliery of the Raub Coal Co., Luzerne, Penn. He complained that he had been discriminated against in being discharged from his position. However, the colliery foreman testified that Stoneham was careless and that the men employed on the slope had declared that they would quit if the man was not removed.

### Electric Motormen Want Oil Motormen's Pay

In another complaint the electric-locomotive runners of Hazleton No. 1 colliery of the Lehigh Valley Coal Co. wanted the pay accorded to drivers of gasoline locomotives, though the work involves far less competency. They complained they were getting 23.1c. per hour instead of 27.2c. per hour, which was the gasoline-locomotive man's pay. The company showed that the rate sheet filed with the board and accepted by the union provided separate rates for the two classes of employees.

The contract miners of the Red Ash vein of the West End colliery, belonging to the West End Coal Co., of Mocanaga, presented a grievance, claiming that hitherto they had been paid 82c. and \$1 for standing props of certain sizes, but that they were now being paid only 55c. and 60c. The company contended that there has never been a fixed rate for setting props, but that the amount payable has been left to the discretion and judgment of the foreman.

At No. 23 tunnel of the Coal Brook colliery, operated by the Delaware & Hudson Co., the miners filed a complaint against the cutting of bottom rock without compensation. The company contended that the miners were not required to take up bottom rock except where additional height is needed. In such cases they are paid for lifting bottom at a rate of 97.5c. per foot per yard.

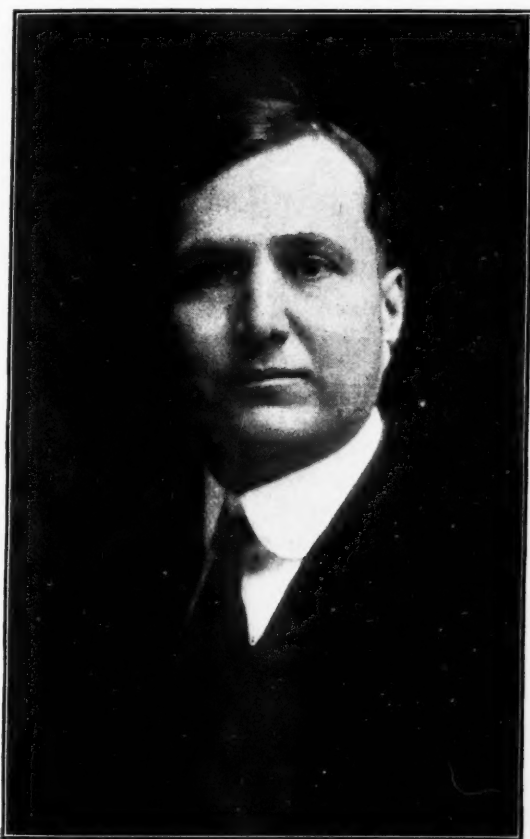
Charles P. Neill, the umpire of the Conciliation Board, has decided that where contract miners are compelled to "fight gases" due to improper ventilation, the operators must pay the men the day rate of \$3.19, which is that provided for "dead work." This finding was made on behalf of J. W. Harrison and Walter Walkins, of Nesquehoning, in a case against the Lehigh Coal and Navigation Co.

## Who's Who in Coal Mining

### Fred S. Pfahler

One of the interesting characters associated with the Illinois coal-mining industry during the past 10 years is that of Fred S. Pfahler, who has during that time risen from the position of assistant engineer with the Southern Coal, Coke and Mining Co. to the general superintendency of the company.

By his industry, energy and genial personality, Mr. Pfahler has, in this short period, become well known to coal-mining men in Illinois. There could be no stronger



"FRED" PFAHLER

General Superintendent, Superior Coal Co.

proof of the recognition his ability and work have received than the fact that he has now been called to the position of general superintendent of the Superior Coal Co.'s mines, succeeding John P. Reese, who recently accepted an appointment to the office of vice-president and general manager for the Consolidated Coal Co., with headquarters at Gillespie, Ill., where Mr. Reese has long had his home.

In 1901 Mr. Pfahler graduated from the High School at Mason City, Iowa, and for two years thereafter attended the University of Wisconsin. In 1903 he entered the field, in the employ of the Chicago, Burlington & Quincy Railway Co., being engaged as rodman on the construction work of the Mexico Extension from Old Monroe to

Mexico, Mo. In this work he advanced rapidly to the position of transitman, which he assumed in August, 1904. He was then employed on location surveys first in Nebraska and then in Illinois, where he located a part of the Centralia-Herrin coal line.

While engaged in the last named work, the subject of our sketch became acquainted with the Southern Coal, Coke and Mining Co. and, in 1906, accepted a position as assistant engineer in that company. His advancement was rapid and, by a succession of promotions, he finally attained the position of general superintendent of the company, which he now relinquishes for a similar position with the Superior Coal Co., one of the largest coal corporations in the state.

Mr. Pfahler, or "Fred," as his friends know him, is one of those whole-souled personalities that has attracted to himself a large number of friends throughout the state. He is an enthusiast in respect to all matters pertaining to the coal industry. Having served his term as vice-president of the Illinois Mining Institute, he was, last November, unanimously elected to the office of president of the Institute. He has always taken an active part in the affairs of that body, which owes much of its success to his efforts and cooperation.

The work to which Mr. Pfahler has now been called will prove worthy of his best efforts. Mine No. 3 of the Superior Coal Co. has, during the calendar year of 1916, made a new record in the production of coal. On several occasions this mine has held the annual record of production in the state and has also attained the highest record for output of a single day of eight hours.

Mine No. 3 was opened by a shaft 335 ft. deep, which reached the coal Aug. 26, 1905, connection being made with the escape shaft Oct. 27, following. The mine, which is electrically equipped, is operating in No. 6 seam. The coal is all mined by machines and electric locomotives are used for underground haulage. Electric lighting and signaling is also employed.

During the past year (1916), under the efficient charge of John Fraser, mine manager (foreman), the mine produced 1,023,753 tons of coal, which was the largest production of any mine in the state the same year. The best single-day hoist was 5502 tons in eight hours, or nearly 688 tons per hour. Of this output 567,363 tons was hoisted in the last six months of the year. The mine was operated 232½ days during the year, making an average output of 4403 tons per day.

The total output from this mine to the end of the last fiscal year, June 30, 1916, is 7,388,980 tons. This record production has been under the able management of John P. Reese, as general superintendent, and D. D. Wilcox, his assistant. In the minds of all who know the new general superintendent, Fred S. Pfahler, there is little doubt that the record output of this mine will be maintained, if not increased. *Coal Age* and the many friends of Mr. Pfahler are pleased to extend to him their congratulations and best wishes for his success.



## Editorials

### The Decision on Machine Mining

The agreement made by the anthracite operators with the "Anthracite Mine Workers' Organization" is not an agreement that stands alone. It is purely an amending document. When a business agreement is entered into that does not refer to any previous instrument, it is interpreted by the courts, should the necessity arise, in accordance with the mercantile customs generally prevailing.

The agreement of the coal operators, as has been stated, is an amending instrument; and so it can far more truly be asserted that it is of such a character that it cannot be interpreted correctly without inquiring what has gone before. Ask a man to ascertain from the agreement the wage for mining coal or driving or onsetting or any other piece of work, and he could make absolutely no progress. He is forced to say: "Show me the previous practice at this mine and I can figure out the required schedule under the new agreement. This is an amending document. It cannot stand alone. It is unreasonable to ask me to interpret it without knowing what has gone before."

Umpire Neill never believed the agreement self-sufficing and never made any such assumption when making any of his many other decisions. He realized to the full the incompleteness of the document and sought from past understandings to discover the new status for which the agreement called.

There is no reason to suppose with Neill that the machine-mining clauses are exceptions to the general rule. He finds, indeed, that they need a lot of interpreting; he realizes they are deficient in many respects, but he nevertheless boldly asserts that they are "a complete agreement covering the rates and methods of pay of miners doing machine mining."

As the agreement is not self-sufficing, we cannot assume with him that "contracts or bases of pay that are not specifically covered are not permissible under the agreement." There are, in the belief of every one, many bases of pay not specifically covered that are permissible under the agreement. There are payments for draw rock. The agreement says nothing about them. According to Neill, therefore, they are not permissible under the agreement. One can imagine what the mine workers would say about any such statement.

This argument of the umpire will not hold water, neither will the proposition that the letting of a contract is void because the miner cannot, under it, be guaranteed the wage that the agreement provides. A contract made under the agreement requires that the contractor shall pay his men per day or per ton such a rate as will make it possible for them to earn on an average the minimum wage, which is the average wage earned in that section of the mine before the machines were installed. We take that to be the meaning of the agreement and cannot agree with the company that the contractor himself is to be included when figuring the average, though perhaps in this matter

we are biased by good will to the workingman and not moved to that conclusion from any clear meaning in the wording of the agreement. Now, if the contractor makes a profit such as described in Umpire Neill's decision, there is no reason why he should not be obliged to divide with his men, giving them on an average at least the minimum wage and keeping the rest. Of course, if their earnings averaged more than the minimum wage, no interference would be necessary or permissible.

The company has the contractor's money, has guaranteed a wage not less than a certain average amount, and there is therefore no reason why the men should not feel assured that they will get their pay. If its contract is not rightly written, the company may have to stand the loss; but that is its fault. If the contractor fails to make both ends meet, the company may be required to make up the deficiency and may be precluded from making contracts again at such a low figure, unless the contractor was obviously negligent.

Many companies let contracts for drifting and timbering at so much per yard. When the time comes it frequently happens that the contractor has not earned enough to pay his help, and quite generally the management provides that the men shall not be losers; and they usually show some consideration for the contractor if he is not a rich man and so is unable to meet the loss.

It was open to Neill to require the Delaware, Lackawanna & Western Railroad Co. to see that the mine workers got the guaranteed average wage from their labors, the contractor or the company. He cannot void a contract merely because there is no assurance that the miners can earn the guaranteed amount from their labors. Everybody knows that the miner could make his required daily wage from his labor if the rate was adjusted rightly; and doubtless the miners did make such a wage, for the decision does not declare that any miner was deprived of his right.

The inherent defect in all piecework systems is that the worker may not be able to make a living. The mine workers' organization inserted a provision in the agreement that assured the workers an average earning at least as large as before. Such a promise was not necessary if there was to be no contract system. The very introduction of the provision implied that there were to be contracts as before and that the men needed and were to be given protection.

Any per-ton contract with an individual to do the physical work connected with the mining of coal is a contract that in itself does not assure the minimum wage provided. According to Neill, it is therefore void; consequently, the agreement does not provide for any kind of contracting. Why then does it talk about "machine contract rates"? Surely there must be some kind of contracting anticipated, or why would such rates be provided?

If a contract is made by a wealthy firm with a contractor who may be unable to pay his men, there is no reason to break that contract so long as the firm of large

resources is compelled to guarantee the payment of the wages. The court does not need to annul the contract. It does its whole duty when it compels the guaranteeing company to fulfill its guarantees.

It looks much as if Neill took his inspiration not from the agreement of May 5, 1916, but from what he believed to be a higher law. He is like Woodrow Wilson, who on Oct. 30, 1914, said, "Have we got to a time when the only way to change law is by statute?" The umpire regards a contract in the same way. He seems to say, "Can we change an agreement only by making another? What are contracts, indeed, among friends?"

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### The Officers' Reserve Corps\*

In these turbulent times the thoughts of many engineers have no doubt frequently been directed to the question of how they could best serve the country in the event of war. Our peculiarly isolated position has heretofore kept us immune from any serious consideration of invasion by any foreign power, with a consequent indifference to preparedness in any intensive form. The result is, that though potentially the most powerful of any of the chief countries, we are actually the weakest in a military sense, with the possible exception of China.

But in spite of the striking example that we have had presented to us by the European holocaust, it is not the sense of the best thinkers of the day that we become a military power in the literal meaning of the word, though it is the consensus of opinion that we adopt tentative preparedness propaganda that will form the nucleus for a defensive force in the event that an unexpected and urgent contingency arises. It is with this idea in mind that the scope of the Officers' Reserve Corps has been enlarged, by affording those who so desire an opportunity for more intensive training.

In brief the new law as it applies to engineers provides for commissions as first and second lieutenants, captains and majors. Eligibility for a commission as a lieutenant of either grade does not necessitate that the candidate possess any considerable military knowledge, but rests largely on the applicant's military aptitude and professional record. For the grade of captain, in addition to higher engineering qualifications, the applicant is required to have a working knowledge of Infantry Drill Regulations, Field Service Regulations and Part 5 of the Engineers' Field Manual, covering field fortifications. For the grade of major, the applicant is required to know the technique of modern tactics, be conversant with the duties of engineer officers and troops in war, in addition to a somewhat more detailed knowledge of the previous requirements noted for a captain.

The essential differences between the old law and the new are that under the latter the officer is subject to be called out two weeks a year for training and is also subject to call in event of hostilities or threatened hostilities. There is no doubt that the more rigid requirements will substantially increase the efficiency of the new corps. In the event of a call for volunteers, it is understood, of course, that the officers enrolled under the new law will have precedence over the members of the old corps.

The opportunity thus afforded engineers to place their services at the disposal of the country under such advantageous conditions will undoubtedly make a strong appeal to the profession. In addition to the officer corps, the War Department will soon issue regulations regarding an enlisted reserve corps for the engineers, and it is expected that many of the profession, unfitted for the responsibility of an officer, will enlist in this corps.

All those interested in this patriotic movement should immediately address the Chief of Engineers, War Department, Washington, D. C., for an application blank. A copy of a helpful pamphlet on this subject has been issued by the five leading engineering societies and may be obtained on application to any of the respective secretaries; or, if the applicant is not a member of any of the societies, *Coal Age* will endeavor to supply him with a copy.

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### Dangers of Mine-Car Shortage

The practice of having too small an equipment of mine cars has always been recognized as uneconomical. Whenever the driver or motorman goes for a trip he finds he has to wait, if he would obtain his full quota. When he goes gathering, most of his time is wasted in waiting for cars to be loaded or in calling up the roadways of the rooms to find what rooms are ready "to draw." With an excess of cars some system can be adopted so that the driver or motorman may be sure of a trip from a small range of rooms.

This systematic oversupply of cars makes for safety. The driver who is always urging haste on the miners and loaders inevitably causes them at times to load cars when they should be propping their rooms or taking down slate. The slow turn makes it essential to load every car offering. Consequently, the miners are apt to return to the face before the smoke has rolled away, and they are prone to overlook a bad piece of roof in the deficiency of illumination.

An analogy might help clarify matters. When street cars are few, passengers run excessive risks to get on them. Elderly persons frequently overexcite themselves in striving to arrive in time to mount them. The young and venturesome risk a limb trying to get on when the car has started. When street cars are more frequent and time is less of an issue, the anxiety is less and fewer risks are taken.

It is a similar case when there are plenty of mine cars. The miner knows he will get plenty of time to load his car, and he tends to go about his work in a methodical way. He is not harried by the driver for being slow, and he is not apprehensive of losing a full day's reward if he does not match his output all the time with his opportunities.

Plenty of cars do not necessarily mean an extremely rapid turn which might well involve dangers of its own. The cars need not be taken away as soon as loaded. The maximum of danger exists when drivers are so short of equipment, as at some small mines, that they expect to take out on the return trip the cars they bring in with them. This is an extreme condition, but there are others only a little less dangerous. Where the distance to the main parting is short, the trips of the gatherer may be frequent and the time given for loading between trips too restricted. If all the miner has to do is to load the

\*Reprinted from "Coal Age" of Oct. 28, 1916.



coal, well and good; but if it has to be shot down or double shoveled, or if the roof has to be barred down, track extended or props set, the time is too short. If the turn can then be made to run a little slower, it is likely that more care will be exercised. Unfortunately, safety has sometimes to wait not only on the unloaded car but also on the well-loaded dinner pail and does not always get the attention to which it is entitled.

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## Federal Regulation of Car Supply

A highly important principle was put forward in a recent decision (No. 9284) of the Interstate Commerce Commission. It was held that certain practices of the railroads in failing to observe or to make effective rules that are reasonable with regard to the return of foreign freight cars are in violation of the act to regulate commerce. After reviewing the inquiry begun in November and the apparent futility of looking to the roads themselves for remedy and, further, the fact that a Federal justice had ruled there could be no relief at law in advance of action by the Commission, the latter by a majority opinion declared that a formal mandatory order was "necessary to protect shippers, consignees and the general public." "Not less is it necessary," continued the Commission, "to protect those carriers which have sent foreign cars home in obedience to the direction at the hearing but which have not received their own cars from other lines."

The Commission now prescribes what it finds to be reasonable car-service rules, modifying the American Railway Association code by eliminating certain movements of foreign cars other than to the owning road, or in its direction, which the present code permits. The roads are notified that after Feb. 21, 1917, and continuing until May 1, 1917, "any delivery of a foreign open-top coal or coke car or railroad owned or controlled refrigerator, heater, ventilated or insulated car, except as provided in these rules, is a diversion."

The statutory fine for the violation of a specific order of the Interstate Commerce Commission is \$5000, and it is plain that the regulating authority is now fully roused to the needs of the situation. If the lines themselves through executive action appoint a committee with full power to secure a relocation of cars and to cooperate with the Commission, the latter will consider any facts brought to its notice tending to show modifications that may be necessary; but unless this be done within ten days from the service of the order in the case, the entry of a further mandate prescribing car-service rules for other classes of equipment will be considered.

As compared with the railway association rules, the Commission's order is drastic enough to show results. The diversion penalty as fixed by the carriers' representatives effective Jan. 1, 1917, but afterward removed, was \$5 in addition to the per diem (now 75c. and susceptible of increase for a specified period to \$1.25, instead of the old flat 45c.); and if a diversion has been made without being reported, the penalty was to be \$10. Therefore, the Commission's \$5000 fine looks more like business.

If now many of the railway managers find themselves in a tight box, they have only themselves to blame. It was seen early last fall that the excess of open-top cars was largely in the West, and it was on account of the shortage of coal cars threatening a fuel famine that early in November the lines were notified to return them to their

owners. It was stated at the time by one of the railroad executives that a crisis had been reached where the carriers would have to demonstrate their ability properly to handle their own affairs or some other body would do it for them. The Commission's action, therefore, is a necessary consequence of the flagrant abuses of car service that have been perpetrated.

An instance is cited of a Northern Pacific refrigerator car away from the home line since Aug. 13, 1915, being found in December, 1916, loaded with grain. Much of the intervening time it had been shuttled back and forth on the Atlantic seaboard.

In normal course of business the roads receiving and not originating coal shipments have on their lines an excess over cars owned, while roads originating coal traffic ordinarily hold less than their ownership. Notwithstanding this, the Commission felt that roads having an excess of coal-car equipment should substantially have reduced the excess when so requested. Instead, the percentages in many cases materially and steadily increased. Particularly was this true of railroads in New England with coal traffic inland from Tidewater terminals.

In other words, foreign coal cars have been held for local line use, the request of the Interstate Commerce Commission to the contrary notwithstanding. Meanwhile, important coal originating roads like the Norfolk & Western, the Chesapeake & Ohio and the Western Maryland had on their lines Jan. 1, only 55 to 60 per cent. gondola, coal and coke cars to the total owned. On Nov. 15 the Norfolk & Western percentage was less than 51. The Chicago & North Western on the same date had 143 per cent. and the Chicago, Milwaukee & St. Paul 186 per cent.

Glaring inequalities must be corrected. Whether the railroads will now act promptly and whether the Commission's ruling will be modified remains to be seen. It would be peculiarly unfortunate if there should be any lack of coördination between the railways as a whole and the regulating body, very unfortunate, indeed, if the much needed relocation of cars should break down through the Bourbon attitude of a few executives. Certain it is the present emergency has brought into bold relief the broad powers conferred upon the Commission by the Interstate Commerce Act.

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## "Collusion"

Philadelphia has always been more or less of a center for vicious attacks on the elusive coal trust. These attacks have generally been led by the sensational press of that city who have alleged collusion in this and collusion in that until the average coal official scarcely dares to confer with any other member of the industry.

The price of all the newspapers at Philadelphia was recently doubled. The advance took place on the same day, with the same editions, and at the same hour. It was uniform on the part of practically every paper, and in every conceivable way. To the District Attorney at Philadelphia who has recently been so aggressively investigating collusion in the fixing of coal prices, we respectfully suggest this as a more fruitful field in which to practice his inquisitions.

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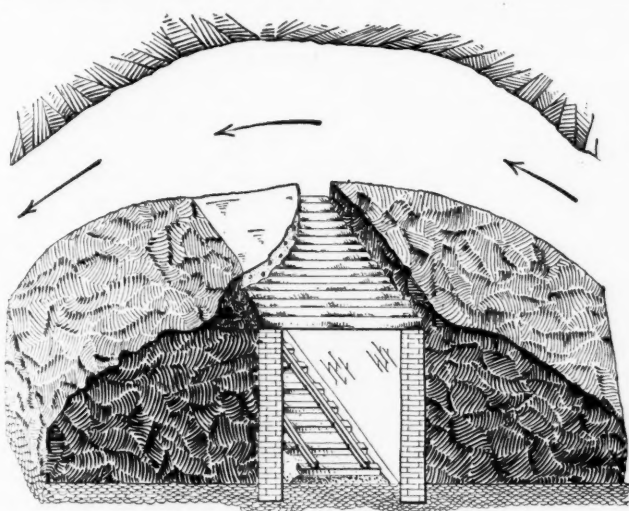
The Annual Success Number of *Coal Age* will be published April 7. We aim to make it the best issue of this paper ever printed. Give us a *Success* story about a man, a machine or a mine.

## Discussion by Readers

### Construction of Mine Overcasts

*Letter No. 1*—In connection with the interesting reply to the inquiry of Henry Groos, in regard to the most economical and serviceable method of constructing mine overcasts, *Coal Age*, Jan. 27, p. 204, permit me to describe, briefly, a method of construction much employed in the Pittsburgh district. This method is, I believe, about the cheapest and most satisfactory form of overcast that it is possible to build.

The first step is to shoot down the roof on the haulage road, at the point where it is proposed to build the overcast. The excavation in the roof must be carried to such a height as to provide an area in the overcast at least equal to the sectional area of the airway. Having blown down the roof over the road, the excavation is carried to the right and left on each side and above the coal. After proceeding a short distance, these side excavations are



PERSPECTIVE VIEW OF OVERCAST, PITTSBURGH SEAM

sloped downward, but not too steeply, as shown in perspective in the accompanying figure, until they connect with the airways on either side.

Having completed this excavation, a cut is now made in the rib, on each side of the haulage road, to furnish room for building substantial sidewalls that will form the foundation of the floor of the overcast. These sidewalls can be constructed of well burned brick or concrete, as desired. They are carried up to the level of the roof of the haulage road, which is but a few inches below the level of the floor of the overcast.

As shown in the figure, old boiler flues or discarded water pipes, up to 3 in. in diameter, are used to form the foundation of the floor of the overcast, or air-bridge. The pipes are cut to the proper length and laid on the sidewalls so as to span the roadway. They are embedded in cement, and cement is spread over them to a depth of 2 or 3 in. to form a solid air-tight floor, or bridge. All joints or open cracks that would allow the air to leak from the airway into the haulage road are sealed with cement.

In case the rock sides of the excavation above the bridge do not stand without support, sidewalls must be built here also. As a foundation for each of these walls in the overcast, two 60-lb. or 80-lb. T-rails are laid across the opening and, like the pipes just mentioned, made to rest on the top of the sidewalls in the roadway and embedded in cement. The upper sidewalls are then built and carried up to the roof of the excavation.

This makes an absolutely fireproof overcast that has given good service throughout this district. Where the sidewalls are built of brick, it is possible to use these again, should the overcasts no longer be required. The work is completed by carefully sealing all open joints or cracks that would permit the leakage of air.

MAX.

Smithton, Penn.



### Oil and Gas Wells in Coal Fields

*Letter No. 1*—I noted with interest the request of a Pennsylvania official for a thorough discussion of the question of the regulation and control of sinking oil and gas wells in coal fields, *Coal Age*, Dec. 30, p. 1101. I do not wonder that this correspondent expresses surprise that the matter is not treated in the mine laws of Pennsylvania. It is a good question for discussion, and I want to suggest as a basis for the views expressed by contributors the provisions made in the Ohio Mining Law, regulating this matter in that state. The subject is treated in sec. 973 of the Ohio law, the first paragraph of which reads as follows:

Any person, firm or corporation causing to be drilled any well for oil or gas, or elevator well, or any test well within the limits of any coal-producing county of this state, must give notice in writing of such act to the chief inspector of mines, stating the location of the land upon which such well is to be drilled.

The law then prescribes that the person, firm or corporation owning the well shall make or cause to be made an accurate map on a scale of 1 in. to 400 ft., showing the location and number of wells and the property lines and giving the township, section and quarter section in which each well is drilled, and the distance of each measured from the section line or quarter section line.

The original map is to be retained by the owner or surveyor and a blueprint copy filed with the chief inspector of mines and another with the recorder of the county in which the wells are located, within 60 days after starting to drill, or if drilling is continuous, at the end of each year.

The law further provides that no oil or gas well shall be drilled nearer than 300 ft. to any opening used for the ingress or egress of persons employed in a mine, or closer than 100 ft. to any inflammable structure connected with and a part of the operating equipment of the mine.

In case a hole drilled for oil or gas penetrates any mine excavation, the law provides that it shall be cased so as to prevent the inflow of surface water into the mine. The hole must then be drilled to solid rock, or 30 ft. below



the floor of the mine and a casing inserted passing through the mine, the bottom of the casing to be not less than 10 ft. below the floor of the seam.

When such a hole is to be abandoned before all the minable coal has been removed, the owner of the well must leave in the hole the casing passing through the mine from a point not less than 10 ft. below the floor of the same and extending 5 ft. above the roof. The hole must then be plugged by filling it with cement for a distance of not less than 20 ft.

The law specifies that when an oil or gas well that has been drilled through workable seams of coal is to be abandoned it must first be plugged by driving a seasoned wooden plug to a point 30 ft. below the lowest workable seam, and the hole is then to be filled with cement to a point 20 ft. above the first seam and another plug driven into the hole above the cement.

Finally, the law provides that the chief mine inspector shall be notified when drilling is commenced, and if continued a report must be made of the number of holes drilled, the date when drilled and by whom, at the end of each year. The chief mine inspector must also be notified of the proposed abandonment of an oil or gas well at least 10 days before, so that he can arrange to have one of his district inspectors present at the time the hole is abandoned.

GEORGE N. LANTZ.

New Straitsville, Ohio.

## Textbooks in Examination

*Letter No. 12*—In my opinion, as far as the examination is concerned, a man should not need a textbook to enable him to pass. What he does need is practical experience and good judgment. In the first place, an examining board should select questions that pertain to practical mining. I do not favor the use of textbooks, but would urge, instead, that the examination consist of questions regarding things that occur daily in the mines.

Not one foreman in a hundred ever bothers his head in the mine with trying to work out mathematically a question in ventilation. In my own experience I have never yet felt the need of a textbook formula to deal with any problem in the mine. My observation leads me to conclude that mine foremen and their assistants never use such formulas after having once passed the examination and secured a certificate. Few of them ever think again of the books they studied for that purpose.

### VIEWPOINT OF A CERTIFIED MINE FOREMAN

While I am a certified man and can work any question in mine ventilation, know all the formulas and am well posted in figures, I feel it is more important to make a close study of conditions. My instructor in mining, James Jeffreys, who was a mine foreman of experience, taught me the importance of observing little things, which he said "always lead to bigger things."

Instead of questions requiring the use of formulas, I think examiners should ask: How is a mine developed? What haulage system should be adopted? How should airways be timbered and the mine drained? How are accidents caused and how can they best be prevented? What means should be used to deal with different roof conditions? And, last but not least, How should a foreman deal with different men?

Many mine foremen whom I have known and some for whom I have worked should, in my opinion, be still digging coal. I want to suggest that, as a remedy for these conditions and to secure a better class of men, mine foremen and assistant foremen should be examined every four years. This is more important for the reason that, having once passed the examination, most of these men throw their books aside and stop reading and studying.

Many men, on assuming the position of mine foreman, seem to forget that they were once a mule driver, track-layer or timberman. They seem lifted up and adopt a surly way that is ill-suited to get the best work out of their men. I think that a more frequent examination of these men would keep them brushed up and cause them to read and study. For myself, I am ready to take the examination and believe I would be equally well suited timbering as bossing.

JOHN H. WILEY.

Oliphant Furnace, Penn.

*Letter No. 13*—I cannot agree with Thomas Hogarth and the other writers of previous letters who think that the use of textbooks by candidates will not lower the standard but make the examination more practical than it is at present. On the other hand, I concur with the opinion that has been expressed, that questions involving formulas, coefficients and constants should not be asked at mine foremen's examinations.

The object of an examining board, in my opinion, should be to ascertain what the candidate knows about mining, as based upon his practical experience and told in his own way. While I have no argument to offer against mining men being familiar with formulas and the use of such constants, I believe it is much more important that mine foremen should understand how to timber a dangerous place and know when an airway or room is safely timbered and made secure for work. Such knowledge is, to my mind, more important than the calculation of the quiescent breaking load of such timbers. It often happens that a candidate is able to make these calculations but knows little about the practical work of timbering.

### THE PRACTICAL SIDE OF THE EXAMINATION

Again, it is more important for a foreman of a gaseous mine to know how to use a safety lamp and to handle a large body of accumulated gas, than to be able to give the chemical formulas or symbols of the different mine gases. Many who can do this know practically nothing about the work of testing for gas in mines or removing gas that has accumulated in the workings.

The foreman who knows how to keep a mine in safe and normal condition, produce a good output of coal and maintain a low cost of operation, is worth more to a company than a man who can extract the square root of numbers and perform other mathematical stunts but makes a poor showing in the mine and allows his cost-sheet to run high.

When looking for mine foremen, operators are more interested in finding out what an applicant knows in regard to managing and controlling men in a way to produce the best results and hold a supply of good miners at a time when miners are prone to be on the move.

I want to explain my position correctly by saying that it is all right for mine foremen to know formulas and constants in addition to other things pertaining to the

practical work of mining, but a knowledge of such technical data does not prepare a man for work underground as effectually as a knowledge acquired by experience.

Finally, I believe the presence of textbooks in an examination room would lead many candidates to copy largely from them in answering the questions asked by the board. This would have the effect of causing men to make less effort to study and acquire a knowledge that would help them in the practice of mining.

Dayton, Tenn.

JOHN ROSE.

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## Yield on Coal Investments

*Letter No. 1*—This subject is one of special interest to me, and I am taking the liberty of expanding the reply given to an inquiry in *Coal Age*, Jan. 6, p. 33.

As indicated in the reply to the question, "What is the rule or formula by which one can estimate the probable output of coal or the available tonnage per acre in a given tract?" the amount of coal underlying a tract of land does not represent the possible extraction in mining operations.

For the purposes of estimate, however, there is a convenient rule that can be applied and which will give very approximate results, with the understanding that these are subject to modification in accordance with the particular conditions affecting the mining and marketing of the coal. Some of these conditions are natural, while others arise in the operations necessary to realize on the product.

### ESTIMATING THE AVAILABLE COAL

The rule or formula to which I refer is as follows: The specific gravity of the coal multiplied by 100 gives the available tonnage per inch-acre, assuming uniformity over the entire area and a level seam. This rule allows for a loss, in mining and handling, of an amount slightly exceeding 10 per cent., which will about average general mining practice today, or equal an extraction of, say 90 per cent. of the coal.

But, as I have just stated, allowance must be made for such natural conditions as faults in the seam, unworkable or impure coal, bad roof and other causes that will impair the extraction and reduce the estimate to a marked degree. Attention has been drawn to these conditions in the previous reply to this inquiry and, as there stated, a practical knowledge of such conditions can only be had from reliable prospect records covering the entire area in question. It may be necessary to reduce the available tonnage obtained by applying the rule I have just suggested, say 25 per cent., more or less. The rule applies only to level seams. When the seam is inclined, the result obtained must be divided by the cosine of the angle of inclination of the seam.

### COMMERCIAL SIDE OF THE QUESTION

The second question asked by "Inquirer" is of even greater importance, commercially, than his first question. It may be of interest to him to know that, as a basis of estimate that can hardly be said to be even "approximate," it is sometimes assumed that coal-mining operations require practically \$1 of capital for every ton of annual output of coal. And the profits may average 5c. per ton, or 5 per cent. on the investment.

As an illustration, showing how variable are the profits in the coal industry and how unreliable such an estimate

as that just mentioned would prove, I know of mines making a profit of 30c. per ton of output, which would mean, on the above estimated basis, a profit of 30 per cent. on the investment. Instead of this, however, the same mines are only showing a profit of 3 per cent. on the invested capital. Again, there are mines that are experiencing a loss on every ton of coal mined and marketed; and yet from other sources they are able to realize a profit on the investment. The inquirer must judge for himself of these possibilities.

While discussing this question, allow me to say that it is my belief, born of observation and experience, that the present returns on coal investments are too low. Such investments should be capable of showing a profit of 10 per cent. on the capital without involving the watering of stocks. When one considers the risks involved in the mining of coal, and the uncertainty of market conditions, it is quite evident that these should demand a greater profit on the capital invested than what is possible today.

In considering the question of investments in a coal proposition, it must be remembered that prices for coal are high at present, which increases the profits to a degree, although not in proportion to the rise in price. This naturally makes the proposition attractive at the present time; but a coal investment must extend over a number of years, and it is impossible to forecast the future.

It would be unwise to estimate, for years to come, on a basis of present market conditions. It does not require much study to realize that a 5 per cent. profit demands that the capital invested shall return to the owner within 20 years, which is rather more than the average life of a mine. When this is not the case, the investment is a losing venture.

MINING ENGINEER.

Sydney, N. S.

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## Cleaning Up a Roof Fall

*Letter No. 4*—One of the greatest mistakes that mine foremen make is to give orders for the performance of dangerous work to men who have had insufficient experience or are incapable of executing the task with safety to themselves and others.

A miner inquires, *Coal Age*, Jan. 20, p. 165, whether an assistant foreman did his whole duty when he ordered a timberman to clean up a fall of roof, without instructing him to first pull down any loose slate and timber the edges of the fall to make himself safe. This would certainly be a great mistake, although it is a common one, causing the blame for any accident that may occur to rest both on the foreman giving the order and the timberman who should have used more caution in doing the work.

While it may be argued that a timberman sent to do such work should be an experienced man, it is nevertheless true that the Pennsylvania Bituminous Mine Law, art. 4, sec. 10, requires the mine foreman, assistant foreman or fireboss to give instructions "as to when, where and how timber shall be placed so as to avoid accidents from falls." In my opinion, a foreman or assistant foreman when ordering such work done should not only give the instruction needed for the men to make themselves safe, but go with them and see that his orders are obeyed.

Sec. 2 of the same article specifies that "the mine foreman shall devote the whole of his time to his duties in the mine when it is in operation." One of these duties,



as stated in sec. 9, is to see that "all dangerous and doubtful pieces of coal, slate and rock overhead are taken down or at once carefully secured."

Although the law places the blame for this accident on the shoulders of the mine foreman or his assistant, I believe that the timberman was equally to blame, if not more so, than the assistant foreman. If he was a practical man, he should have known better than even the foreman what was necessary to make the work safe.

Plymouth, Penn.

FRED B. HICKS.

*Letter No. 5*—In regard to the question of the necessity of an assistant foreman instructing the timberman to take down all loose slate and timber the edges of a fall so as to make himself safe, before starting to clean up the slate, there can be no doubt that it is his duty to give such instruction, as required by the bituminous law of Pennsylvania. This is not always done, however, because the timberman is usually an experienced miner and the foreman generally has two or three such places that must be attended to at once.

However, because it is the custom to omit giving these instructions to an experienced man, the mine foreman or assistant foreman is not exempt from blame in case an accident occurs in which the men are injured or killed. For this reason, if the foreman or his assistant could not be on hand when the work was being done, he should give the needed instructions in order to free himself from blame for any accident. It would then be up to the timberman to safeguard himself by taking the precautions that any good workman knows are necessary.

As I understand the law, however, the responsibility in respect to removing dangers in the mine does not rest on the assistant foreman, except in the absence of the foreman, whose duty it is to see that all dangers are removed and places made safe for work. Too often it happens, I think, that the assistant foreman is blamed for much that rightly is the duty of the foreman.

FRANK WENTZ.

Johnstown, Penn.

[This correspondent should read carefully art. 4, sec. 10 of the Pennsylvania Bituminous Mine Law (1911), which states, "Instructions shall be given the men by the mine foreman, assistant mine foreman, or fireboss, or other authorized person, as to when, where and how timber shall be placed so as to avoid accidents from falls."—EDITOR.]

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## Checking In-and-Out System in Mines

*Letter No. 3*—The system employed for checking the men as they pass in and out of the mine, in our case, is practically the same as some that have already been described in previous letters, except in one respect, which I will mention.

Our system consists of the usual check board with hooks numbered to correspond to the check numbers of the men. The daymen all have numbers, the same as the miners working on the coal. The difference between this system and that generally used, however, is a brass check that is kept hanging on the hook for each man working in the mine. The word "In" is stamped on one side of this check and "Out" on the other.

As a man passes into the mine, he turns his check to read "In," and when coming out he again turns the check to read "Out." It is important in any check system to en-

force a penalty whenever a man passes the checking board without checking himself as in or out. It is only by such means that the men will come to understand that they must comply with the regulations and is the surest means of making men remember.

JOHN BUGGY.

Chambersville, Penn.

*Letter No. 4*—Being somewhat familiar with the conditions existing in the Washington Coal and Coke Co.'s mine, and replying to the request for suggestions of a suitable checking in-and-out system, *Coal Age*, Jan. 20, p. 165, allow me to say that the most simple and practicable system, to my mind, is the following:

At the entrance of the mine, or other suitable place on the surface, two checking boards are arranged, one for the miners and one for the daymen. Each man is given a check stamped with his number. He hangs this check on the board when going into the mine and removes it when coming out. The board is in charge of the mine foreman or his assistant, and one of these officials remains at the place in the evening, until all the checks have been taken off the board by the men coming out of the mine.

In addition to these checking boards provided with hooks numbered to correspond to the numbers of the men working in the mine, there is a directory kept in the lamphouse that shows the location of the man having any given check number. In case a man is changed from one entry to another this change is promptly noted in the directory, so that it is easy to ascertain where he may be found should his check remain on the board after the time for the men to have gone home.

Should this happen, the mine foreman or his assistant in charge of the board, after waiting a reasonable time for the appearance of the man, refers to the directory to get his location and at once proceeds to look for him in the mine. I believe that such a system would work well in the mine referred to in this inquiry.

J. J. MCCARTHY, Gen. Supt.,

Adrian, W. Va.

Buckhannon River Coal Co.

*Letter No. 5*—In answer to H. C. Elkins' request for suggestions in regard to the best system to employ for checking men going in and coming out of a mine, I could mention a number of different methods employed, but will only describe one that I have found most practical in my own experience. It is as follows:

Assuming there are, say 200 men underground, install a check board at the mine entrance, having as many hooks numbered to correspond to the check numbers the men use in the mine. Give every man a check stamped with his number and let each man hang his check on its proper hook on the board when entering the mine and take it off when he comes out again.

The difficulty experienced, at times, in the use of this system is that men will frequently forget to hang their checks on the board when going into the mine or fail to take them off from the board when they come out. Such an omission, of course, causes a good deal of trouble and annoyance.

Seeing a man's check hanging on the board after the time when every man is supposed to be out of the mine, the night man notifies the foreman and he at once organizes a searching party to go into the mine and look for the man, who is believed to be injured, overcome by gas or killed by a fall. If the man lives near the mine, of

course a call is made at his home before a search is begun in the mine, but even this is an unnecessary annoyance.

At several mines, this difficulty has been practically overcome through an agreement between the mine foreman and the men to the effect that, in case a man forgets to hang his check on the board when going into the mine, he will lose his turn for the day and must go home as soon as his mistake is discovered.

Or, if a man forgets to take his check from the board when passing out of the mine, he is obliged to pay the men for their time in hunting him up, whether he is found at his home or whether the men go into the mine and search for him. These penalties imposed on a forgetful man generally have the effect of making him mindful of his duty in this respect. In other words, the penalty for failure jogs the man's memory quite forcibly and he is very apt to remember thereafter.

The system has one advantage, incidentally, and that is that a driver or motorman, by consulting the board, knows how many men are at work in his section and is saved the trouble of serving cars where men are not at work in their places, or stopping to investigate such places to see if the man is at work. As previously stated, a man failing to hang his check on the board when going into the mine loses his turn, the driver leaving no cars at his place, and he is soon notified to quit and return home.

Madera, Penn.

SAMUEL JONES.

### Mine-Accident Record

*Letter No. 8*—I have been reading with interest the series of letters in *Coal Age* relative to accident records in mining. I will relate a few that have come under my observation and which with proper heed might have been avoided. A thoughtful analysis of the conditions might secure us against a repetition of any of them.

About a year ago a miner working at the face of a dip heading where his coal was gathered by motor was fatally crushed when the motorman lost control of the trip and allowed it to slip back into his place. There was absolutely no chance for the man in so tight a place. An accident of this nature can be avoided by anticipating the danger and providing some sort of wrecking device that will wedge or derail the trip before it reaches the face.

Some years ago, in this region, a laborer, riding on top of a mine locomotive, had the life crushed out of him. The armature bearings failed suddenly and the armature forced its way up through the deck of the machine, pinning the man to the roof, which was quite low. I experienced a similar accident to the foregoing, myself, not long ago; but the roof was high and the worst it did was to roll me off the motor and luckily I received only slight bruises.

Many miners follow the dangerous practice, in traveling haulage roads where manways are not provided, of trying to reach the next refuge hole when a trip is close on their heels. This is the height of foolhardiness. I have seen some men forced into exceedingly tight places, owing to their failure to make the next hole, clinging to the rib while the trip brushed by them. There were plenty of refuge holes, 50 or 60 ft. apart. Two such cases were attended with fatal consequences. It is a foolhardy venture to attempt to "make the next hole," while it requires a very cool head to conduct oneself in a tight place, and this everybody does not possess. Even then one

stands a chance of being caught by a protruding iron or brake or a derailed car.

Speaking of blasting, I saw a man light a fuse that, judging from the time that elapsed before the shot went off, was about 6 or 8 in. long. The sputtering fuse put his light out and he would have had to grope his way through the dark from the danger if I had not been there. The shot exploded about 30 sec. after he had lit the fuse. There is no remedy too drastic to abate this practice. The miner's only excuse was that he wanted to save a little fuse.

I recall two instances where men returned too soon to the face to see "why their shots had not gone off" and the shots exploded when they reached the place. It is well, except when using electric batteries, to fence the place off if a shot misses fire and not go back till the next day.

### ACCIDENTS IN ELECTRIC BLASTING

Three cases occurred in my experience where, in firing shots with electric batteries, the men connected up the battery first and then proceeded to connect the cable with the shot. One of these shots fortunately did no harm, because it blew through into another room; but the others resulted in serious injuries to the men who were so wantonly thoughtless.

In the majority of accidents coming under my observation where men have been killed or injured by a fall of slate, had they not taken a chance with the known insecurity of the roof the inevitable accident might have been avoided. It is an exceedingly dangerous practice to enter a place immediately after shooting. Ample time should be allowed for any loose slate to fall, and then the place should be entered cautiously and the roof examined before starting to work. I once helped to recover two men who were found buried beneath the same fall, because they doubtless disregarded this simple precaution.

Thomas, W. Va.

W. H. NOONE.

### Bonus System in Mining

*Letter No. 11*—The accident due to offering a bonus to a motorman, related by "Experience," *Coal Age*, Dec. 30, p. 1099, brings to mind a little experience of my own as motorman in a mine. The incident that I am about to narrate might have cost me my life; it was as follows:

When running a motor in a mine, some time since, I was hauling on an average of 120 cars from the face to the shaft bottom. One day the mine foreman said to me, "Dig in, Steve, and get me 150 cars today, and I will give you a box of cigars." The following day when he repeated his offer, I determined to do what I could. The first two trips from the face to the bottom were made very quickly. But, on the third trip in, my motor jumped the track, and I narrowly escaped being seriously hurt.

It required 3 hr. to get the motor back on the track. The result was that, instead of gaining 30 cars over my average run, I only put 90 cars on the bottom that day, which was 30 cars less than the usual number.

This taught me a lesson and, I think, the mine foreman profited by the experience also. He probably will not offer another bonus to a motorman again, for some time to come. I am convinced that the offer of a bonus to a motorman will cause him to run many chances.

Leckrone, Penn.

MINE MOTORMAN.



## Inquiries of General Interest

### Exhaust vs. Force or Blower Fans

I have heard it argued that the exhaust fan is a more efficient type of mine ventilator than a force or blower fan. There are those, however, who take the opposite ground and claim that better results are obtained when a centrifugal fan is operated as a blower, the conditions in the mine being the same in both cases. I would very much appreciate the opinion of *Coal Age* in this regard. While I favor the use of an exhaust fan, I am open to conviction.

EXHAUST.

Holden, W. Va.

The exhaust and blowing systems represent two types of mine ventilation, each of which is adapted to particular conditions existing in the underground workings. These conditions must be carefully considered in deciding on the method to be employed in the ventilation of a mine. The practical efficiency of a ventilator is not wholly determined by its ability to circulate a given volume of air against a certain pressure or water gage with a minimum power.

In general the principle may be laid down that a mine generating large quantities of explosive gas should be ventilated on the exhaust system, so that haulage may be performed on the main intake airway. This would be impracticable in the use of the blowing system, for the reason that doors would then be required on the main road, in order to prevent the air blown into the mine from escaping directly up the hoisting shaft.

But economy of operation will not admit of doors being placed on the main haulage road at the shaft bottom or at any point that would obstruct the free output of coal. The haulage road and the hoisting shaft must be kept free from all such obstruction. Hence, when it is necessary to make the main haulage road the intake for the mine, the exhaust system of ventilation must be employed and the fan located at the mouth of the return airway or the top of the upcast shaft.

Again, the blowing system will prove more efficient where the main road leading into a mine passes through old abandoned workings that have been sealed off. Instances are on record where the exhaust system of ventilation was employed in such mines and, as a consequence, the intake current was continually fouled by the damps drawn from the old workings. This is particularly the case where the subsidence of the overlying strata following the extraction of the coal has opened cracks or fissures to the surface. Under these conditions, the mine being ventilated under a pressure less than that of the atmosphere, the outside pressure forces the impure air and gases generated in the old workings out into the airway and they are carried into the mine.

The only remedy possible, under these conditions, is to employ the blowing system of ventilation and ventilate the mine under a pressure greater than that of the atmosphere. What was formerly the main intake airway will now be the main return, and the gases and impure

air of the old workings, instead of being drawn into the mine, will be forced out through the cracks and crevices extending to the surface. Excellent results have been obtained where the system of ventilation in such mines has been changed from the exhaust to the blowing system, by changing doors in the fan drift and in the mine.

Aside from the physical conditions affecting the ventilation of a mine, it can be stated that a ventilator is always more efficient when operated as a blower than it would be if exhausting the air from the mine under the same conditions of mine resistance. The only exception to this general rule will occur when the main return current is heavily charged with carbon dioxide, or has a temperature lower than that of the outside air. In a well managed mine, however, carbon dioxide is seldom present to such an extent.

On the other hand, the return current is frequently charged with methane and quite generally has a higher temperature than the outside air. Both of these causes render the air revolved within the fan when the latter is exhausting much lighter than the air that would fill the fan operated as a blower.

Since the power developed by a centrifugal ventilator depends alike on the volume and density of the revolved air, or the weight of air handled per minute, it is clear that the efficiency of such a machine will be the greater when working on air of greater density, and vice versa. Stated in a few words, a greater percentage of the power applied to the fan shaft will be converted into power on the air when the fan is working on air of greater density, which is the usual condition when the fan is operated as a blower.

It is sometimes claimed that the frictional resistance to the passage of an air current increases with the density of the air. While this is true, its effect in mine ventilation and, particularly, in reference to the efficiency of a fan, is inappreciable and of no practical value.

A feature of this discussion that is often overlooked is the effect of the mine resistance to increase or decrease the density of the air revolved within the fan, according as the latter is operated as a blower or exhausting air from the mine. In the blowing system the pressure in the fan drift exceeds the atmospheric pressure by an amount determined by the mine resistance.

On the other hand, in the adoption of the exhaust system for the ventilation of a mine, the pressure in the fan drift is less than the atmospheric pressure by that due to the mine resistance. Owing to this fact alone, the density of the air revolved in the fan when blowing will be from 1 to 2 per cent. greater than in the exhaust system of ventilation. The mine resistance is practically the same in each case, as indicated by the water gage on the fan drift; but the air within the fan is compressed when blowing and expanded when exhausting in proportion to the resistance of the airways. This effect, in addition to that produced by the higher temperature of the mine and the lighter gas in the return, is appreciable.

## Examination Questions

### Tennessee Mine Foremen's Examination Held Oct. 9-12, 1916

(Selected Questions)

**Ques.**—What percentage of firedamp is the most dangerous?

**Ans.**—The question means to ask, What percentage of methane, or marsh gas, mixed with air is the most dangerous in mines? The danger of a mixture of methane ( $\text{CH}_4$ ) and air increases with the percentage of gas above the maximum explosive point. Probably the greatest danger would be reached when the mixture was just above the higher inflammable limit of the gas. Because, at this point, where the mixture contains practically 30 per cent. of gas, any addition of air, which is very liable to occur in the mine, would render the mixture at once inflammable. As the addition of air was increased, it would become explosive and the violence of the explosion would increase up to the maximum explosive point. But beyond this point the further addition of air would decrease the explosive violence and the inflammability of the mixture, until the lower inflammable limit was reached. It is the liability to dilution of a mixture of methane and air above the higher inflammable limit that makes such a mixture more dangerous than one below the maximum explosive point.

**Ques.**—Explain the principle discovered by Davy and embodied in the safety lamp. What is the standard size of wire gauze used in the Davy lamp?

**Ans.**—The principle of isolating the flame of a lamp from the outside atmosphere by means of wire gauze, which was discovered by Sir Humphry Davy, in 1815, depends on the cooling effect the wire forming the gauze exerts on the small streamlets of air charged with gas passing through the mesh. This principle is illustrated in the accompanying figure, which shows the flame of a candle burning underneath a piece of wire gauze. The flame is flattened out beneath and cannot pass through the mesh as long as the gauze remains cool. But, as shown in the figure, if the wire becomes heated, the flame then passes through the mesh and burns above the gauze.

In a safety lamp the gauze chimney is not directly in contact with the flame of the lamp, except when the lamp is held too long in an inflammable atmosphere and the interior fills with flame.

Davy found that an iron-wire gauze containing 28 wires (No. 28 B. W. G.) to the inch, or 784 openings to the

square inch, gave the best results. This has consequently been adopted as the standard wire gauze for safety lamps in England and in this country.

**Ques.**—What effect will carbon dioxide have on marsh gas when they are mixed together?

**Ans.**—The addition of carbon dioxide to marsh gas, or a mixture of marsh gas and air, has the effect of reducing the inflammable or explosive condition of the mixture. Carbon dioxide always exerts an extinctive effect. The addition of one volume of this gas to seven volumes of a mixture of methane and air at its most explosive point will render the mixture in explosive.

**Ques.**—If you were acting as fireboss and, while making an examination of a mine, you found a large body of explosive gas, state what precautions you would take to prevent an accident from same.

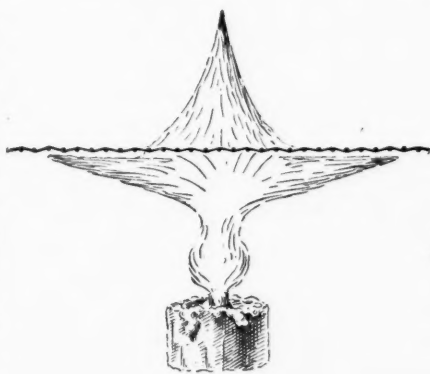
**Ans.**—If the gas is discovered in the early morning examination, no men must be permitted to enter the mine until the gas has been removed and the mine reported safe for work. But if a large body of gas is discovered accumulated in an idle heading or abandoned place when the men are at work in the mine, every precaution should be taken not to disturb the gas and to prevent the entry of any person into the place.

Having safeguarded all entrances to the place, the first step that should be taken to prevent accident is to remove the men from that section of the mine. It may be safer and necessary to withdraw every man from the mine before taking any steps to move the gas. It should be remembered that a fall of roof may drive the gas out from the place where it has accumulated and endanger the lives of men working in adjoining places, or even in other sections of the mine, and no chance should be taken in this regard.

Having withdrawn the men, proceed to increase the circulation of air as needed to dislodge the gas. It may be necessary to erect brattices to conduct the air current forward and cause it to sweep out the gas. Only experienced men equipped with safety lamps of an approved type should be employed for this work, which must progress slowly, giving ample time for the air current to remove the gas.

**Ques.**—What is the best means of removing dangerous gases and keeping the atmosphere of the mine in a good healthy condition?

**Ans.**—Having withdrawn all persons from the return of the affected portion or section of the mine and nearby workings, competent men experienced in the handling of gas and equipped with good safety lamps should be employed. The air current should be increased and deflected by brattice so as to sweep the place where the gas has accumulated. The removal of the gas should proceed slowly, the brattice being extended a few feet at a time until the place is clear. When this has been done, care should be taken to direct the air current in such a manner as to cause it to sweep the face of all working places and prevent the further accumulation of gas.





# Coal and Coke News

## Washington, D. C.

A complaint seeking the removal of alleged existing unjust discriminations against interstate shippers of bituminous coal from mines in Illinois to points in Indiana, and from mines in Indiana to points in Illinois, and from mines in Indiana to points in Indiana via interstate routes, has been filed with the Interstate Commerce Commission, naming the Atchison, Topeka & Santa Fe and other railroads defendants.

The complaint was brought by the American Mining Co.; Ayrdale Coal Co.; Ayrshire Coal Co.; Ayrshire District Colliery Co.; Bicknell Coal and Mining Co.; Big Four Coal Co.; Brazil Colliers Co.; W. S. Bogle and Co., Inc.; Caledonia Mining Co.; Calora Coal Co.; Clinton Coal Co.; Consolidated Indiana Coal Co.; Clovelly Coal Co.; Crescent Coal Co.; Daviess County Coal Co.; Deep Fourth Vein Coal Co.; Erie Canal Coal Co.; Ft. Harrison Mining Co.; Glen Ayr Coal Co.; Green Valley Coal Co.; Gould Coal Washing and Mining Co.; Grant Coal Mining Co.; Hall-Zimmerman Coal Co.; Higgins-Martin Coal Co.; Indian Creek Coal Co.; Interstate Mining Co.; Jackson Hill Coal and Coke Co.; J. K. Dering Coal Co.; Kettle Valley Mining Co.; Knox Coal Mining Co.; Linton-Summit Coal Co.; Lower Vein Coal Co.; The S. W. Little Coal Co.; Miami Coal Co.; Monon Coal Co.; Oliphant-Wasson Coal Co.; Parke County Coal Co.; Princeton Coal Co.; Queen Coal and Mining Co.; Shirkie Coal Co.; Sunflower Coal Co.; Sunnyside Coal and Coke Co.; Sugar Valley Coal Co.; Sunbeam Coal Co.; Tecumseh Coal and Mining Co.; United Fourth Vein Coal Co.; Vandalla Coal Co.; Western Indiana Mining Co.; Washington-Wheatland Coal Co.; Minshall Coal Co.; West Clinton Coal Co.; Big Creek Colliery Co.; T. C. Keller; O'Gara Coal Co.; J. Wooley Coal Co.; and the Ferguson-Spears Coal Co.

It was pointed out that various coal mines in Illinois and Indiana are grouped into a number of districts in the application of rates from such mines, and that the rates from these groups or districts have for many years been maintained upon a fixed differential basis insofar as shipments to Chicago and the Chicago district and other important points in Indiana and Illinois are concerned. The complaint set forth:

"Prior to Dec. 1, 1916, the differentials in rates between the various groups of coal mines in Illinois and Indiana, taking the Danville district in Illinois as the basis, ranged from 3c. over Danville for the Brazil-Clinton district in Indiana, to 31c. over Danville for the Southern Illinois group, on coal moving to Chicago. On Dec. 1, 1916, all of the defendants engaged in the transportation of coal, interstate, between Illinois and Indiana (with the exception of the Cleveland, Cincinnati, Chicago & St. Louis R.R.), advanced their interstate rates on coal 5c. per ton from all Indiana and Illinois points of origin to all interstate destinations in Indiana and Illinois. The Cleveland, Cincinnati, Chicago & St. Louis R.R. advanced its rates on interstate shipments of coal between all points in Illinois and all points in Indiana on Jan. 1, 1917, 5c. per ton.

By the advance in the rates which became effective Dec. 1, 1916, on interstate shipments of coal from the various groups named, all the rates on traffic moving interstate from Indiana to points of destination in the Chicago Switching District were increased 5c. per ton, and the rates from the groups in Illinois were increased 5c. per ton on coal moving to that part of the Chicago Switching District which is in Indiana. The advances which became effective on Dec. 1, 1916, increased the rates to all interstate destinations on shipments from Illinois to Indiana, and on shipments from Indiana to Illinois, and in many cases increased the rates on shipments from Indiana to points of destination in Indiana where the traffic moves through Illinois to reach such destinations in Indiana.

The competition between the coals of the various districts in these common markets is normally so keen that a disturbance of the established differentials to the extent of 5c. per ton in the freight rate will drive the coal burdened with that advance out of the market in favor of competitors whose rates have not been correspondingly advanced.

The advance in the rates on coal from Indiana to Illinois, and Illinois to Indiana interstate, while intrastate rates from Illinois groups to Illinois markets, and from Indiana groups to Indiana markets are not changed, result in direct and unjust discrimination against the interstate shippers.

The aforesaid changes in the rates between the various groups in Indiana and Illinois create a discrimination against mine operators shipping

interstate in competition with intrastate shippers to common points of destinations in the two states. For years the differentials in respect to the Chicago market between the Brazil-Clinton group in Indiana and the Springfield group in Illinois was 5c. per ton in favor of Brazil-Clinton. These coals on that basis of rates were in keen and fair competition in the Chicago market. By the advance in the interstate rate to Chicago from the Brazil-Clinton field of 5c. per ton, the differential which has heretofore existed between the two groups was eliminated and the two districts placed on a rate parity."

The complaint proceeded to cite similar instances where the differentials have been destroyed by the recent rate advance on the interstate traffic in bituminous coal. The Commission was petitioned to direct the roads to restore the relationship and adjustment of rates which existed prior to Dec. 1, 1916.

### HARRISBURG, PENN.

A recent discovery by banks in the anthracite region which act as guardian or trustee of coal estates that they have no authority to make changes in coal mining leases to conform with present-day conditions, is responsible for a bill introduced in the legislature on Jan. 29, by Senator Sterling R. Catlin, and known as Senate Bill No. 53. It authorizes alterations with the approval of the court having jurisdiction.

Throughout the state there are scores of leases entered into over a generation ago, and especially in the anthracite region, these require changes agreeable to the coal companies, or their successors, and the heirs of the original lessors. But notwithstanding the fact that both sides want the changes, there is no legal right given trustees or fiduciaries to make them and the only solution is an act of assembly.

It is stated that one of the important changes required in old coal leases pertains to the payment of the taxes. When these instruments were entered into the tax on coal land was a nominal one and this led to lessors in some cases agreeing to take care of the taxes. But now the taxes on coal have increased to such an extent that some instances are found where the lessors' royalties are less than the amount of taxes.

The bill introduced by Senator Catlin is a short one, and reads as follows:

"That from and after the passage of this act any trustee, guardian or other fiduciary having an interest in any coal mining lease may sell, assign, alter, modify or supplement such coal mining lease with the approval of the court having jurisdiction of the accounts of such fiduciary."

### New Bill for Surface Support

Representative David F. Davis, of Taylor, has presented a bill to the house providing that all coal operators shall work their holdings in a way not to interfere with the security of the surface or improvements thereon.

Principally the bill provides the right of action for any owner of surface land or improvement against the operating company if mining is not carried on so as to provide surface security.

Explaining the presentation of this measure after its introduction, Representative Davis declared that it is not backed by the Scranton Surface Protective Association or the committee which had been conferring with the Governor and the legislators. He said the bill follows practically in its entirety the views presented by former Judge R. W. Archbald of the United States Commerce Court.

Representative Davis states that if there is a measure which he regards more feasible than this to suit the purpose of preventing the mine cave evil, he would be glad to withdraw his bill.

Mr. Davis' bill reads as follows:

"Be it enacted, etc., That all persons, etc., engaged in the mining of coal or other minerals by underground workings or passages shall conduct their business as not to endanger the surface or the improvements thereon or persons occupying or using the same.

Sufficient pillars of coal or minerals shall be left unmined and in such places as to completely and adequately for all time support the surface, both laterally and vertically. Artificial pillars or support of a lasting, and durable character may be introduced and set up with the permission and under the direction of the mine inspector of the district in which such mining is done in lieu of the natural pillars of coal or minerals.

The mine inspector of the district in which the mining is done is charged with the enforcement of the provisions of this act and may if necessary maintain a bill in equity for that purpose.

Any person who is injured in his person or property by any failure to comply with the provisions of this act shall be entitled to an action for damages which shall include the injury done to the surface as well as to any improvements which may be thereon.

The right of action given by this act shall accrue at the time the damage to the surface or the improvements thereon actually take place and shall not be limited to the time when the mining is done.

Any person liable to be injured by the failure to leave or provide adequate pillars for the support of the surface as herein provided may maintain a bill in equity to enforce a compliance with the provisions of this act which remedy shall be in addition to and independent of any action taken by the mine inspector as hereinbefore provided.

Any county, city, borough, town or township whose streets, highways, public buildings or other property are liable to be injured by the failure to leave or provide adequate pillars for the support of the surface as herein provided shall be entitled to maintain a bill in equity to enforce a compliance with the provisions of this act which remedy shall be in addition to and independent of any action taken by the mine inspector or any individual as hereinbefore provided."

### The Commonwealth May Mine Coal

Representative James Maurer, from Berks County, has introduced a bill creating in the Department of Mines a division for the mining and sale of coal, and providing for the mining and sale of coal by the Commonwealth of Pennsylvania.

The bill says that the commonwealth may engage in the business of mining coal and selling the same to residents and inhabitants of the commonwealth and to municipalities and townships.

The bill provides that coal may be mined on lands owned by the state where coal shall have been found and the chief of the Department of Mines may from time to time purchase in the name of the commonwealth such coal lands within the state as he deems advantageous, if the same can be obtained at a reasonable price. He is also given the power to buy any existing colliery with lands adjacent, if any such can be obtained at a reasonable price.

The bill provides further, that the second deputy chief of the Department of Mines, which office is created under the bill under the sanction of the Chief of the Department of Mines, may purchase such machinery, equipment and implements and erect such buildings, breakers, etc., as may be necessary to carry out the provisions of the act.

When any coal is mined by the commonwealth it is to be sold at a price equal to the cost of producing the same, including the payment of the salaries made a charge on the fund for the mining and sale of coal by section seven of the bill and including reasonable wear and depreciation in buildings, breakers, structures, equipment and machinery and a profit of 10c. per ton and in quantities of not more than 20 tons to any one family during any year.

All money received from the sale of coal and from sale of exhausted coal lands shall be paid to the state treasurer and shall constitute a fund to be known as the "Fund for the Mining and Sale of Coal."

The fund is to be used for the purposes of paying the salaries, of all employees in the proposed division and for the purchase of all coal lands building or breakers, repairs and operation of the coal mines.

The sum of \$500,000 is to be appropriated to the fund for the carrying out of the provisions of the act, but it is the intent of the act that the Division for the Mining and Sale of Coal shall be self-supporting.

Mr. Maurer is also asking support on another bill, which will give townships, boroughs, etc., the right to engage in the business of buying and selling coal and providing a system of administration in connection with it.

This bill provides that the councils of municipalities of the state may create a bureau to supervise the buying and selling of coal, and that the coal is to be sold at the actual cost thereof, including the cost of maintaining the bureau, etc., also including reasonable wear and depreciation in property and equipment.

### A New Anthracite Code

An anthracite mine code is to be introduced in the legislature. The bill is being drawn by James E. Roderick, chief of the Department of Mines, who for many years past has been anxious to have a new code drawn to meet the present-day conditions, claiming that the state Department of Mines is handicapped by the present

anthracite law enacted in 1891, and a new code is necessary to the proper regulation of the coal industry and the safeguarding of human life.

It is reported that the miners will fight the proposed code at every angle, while some objections may come from the operators.

The bill being prepared by the chief of the Department of Mines, calls for a number of changes in the mining laws. One of the modifications is to vest with the Governor the power of selecting mine inspectors. This plan is similar to the one now in vogue in the bituminous region.

Another proposed change has to do with qualifying mine foreman. The code will call for a central board to meet to draw up questions, etc., for applicants for mine foremen's certificates. Other changes in the code touch on the use of electricity in coal mines in the anthracite region.

#### PENNSYLVANIA

##### Anthracite

**Drifton**—Mrs. Eckley B. Coxie is having a skating rink constructed for the use of the young people of the mining towns in this vicinity.

**Mahanoy City**—Work on the erection of a washery at Knickerbocker colliery was commenced by the Philadelphia & Reading Coal and Iron Co., on Feb. 1. An electric power plant will also be installed at the colliery for lighting and power purposes. This will also light the villages nearby.

Officials of the Lehigh Valley Coal Co. have begun sealing up the section of the Primrose mine, which has been on fire for some time. When preparations are completed, it is planned to flush the sealed area with water and culm through an 8-in. borehole now being driven from the surface. The colliery is still in operation and no further damage is anticipated.

##### Bituminous

**Waynesburg**—An important deal has been recently closed whereby the Pittsburgh Steel Co., of Pittsburgh, purchased a tract of 688 acres in Cumberland Township known as the Tuit Work block. It is said that \$500,000 were involved in this deal.

**Washington**—Cyrus Ferguson, of MacDonald, recently purchased a tract of 100 acres in Brooks County, W. Va., on which he will build a modern mining town for the development of the coal acreage he holds in that section. The surface purchased by him is known as the Cleveland Underwood farm and is said to have cost \$15,000.

**Altoona**—The Blair-Cambria Coal Co. has granted its employees a bonus of 10 per cent. of the earnings of the corporation, effective at once. About 200 men are involved.

**Barnesboro**—About 7 o'clock Friday evening, Feb. 2, the powder house and an adjoining warehouse of the Madera Coal Co. of Barnesboro was destroyed by an explosion of powder. The cause of the explosion is not known. This being near the first of the month, there was but a small quantity of powder and supplies stored in the two buildings. The loss consisting chiefly of mine supplies will be in the neighborhood of \$1000.

**Boswell**—The Standard Quemahoning Coal Co., which has large interests in the vicinity of Boswell, has closed a deal for 1300 acres of coal land at Thomas' Mills owned by Herman Thomas. This was the last large tract which had not been taken over by one of the numerous coal operators in that section. The consideration is said to be in the neighborhood of \$50,000.

**Smethport**—After a lapse of 35 years bituminous coal is being mined again in McKean county. In 1882 the old Buttsville mine near Mt. Alton closed down after a dispute between the owners and the railroad company, but now with the high prices being offered for coal it has been found profitable to resume operation. It is also rumored that other openings nearby will be made and good tonnages of coal shipped to market if the present boom continues for any great length of time. The coal veins range from 3 to 6 ft. in thickness of a fair quality of fuel.

#### WEST VIRGINIA

**Moundsville**—The Glendale coal mine of the Richman Coal Co. recently resumed operations after a suspension of several days for repairs and improvements. The shaft which threatened to cave in near the top was relined and new cages installed together with a new generator on the engine room.

**Wheeling**—The J. C. McKinley Coal Co. is opening a new mine on Buffalo Creek, which will have a capacity of 300,000 tons per year. Already 10,000 tons of coal have been removed from the mine and hauled away or piled up at the pit mouth. The McKinley Coal Co. now has several mines extending along the Ohio River. The new mine is on a tract of about 1200 acres and was purchased from the Wellsburg Coal Co., which ceased operations several years ago.

**Bluefield**—Statistics recently compiled show that the Norfolk & Western Ry. is the second largest coal carrier in the country. During the year 1916 the record tonnage of 33,949,380 tons

was shipped over this road. Three-fourths of these shipments, it is estimated, were produced in the Pocahontas coal fields, while the remainder originated in sections along the Norfolk & Western and connecting roads. The Pennsylvania R.R. is the world's largest coal carrier, hauling an estimated tonnage of 45,000,000 tons bituminous coal during the past year. The Baltimore & Ohio is third with approximately 31,500,000 tons.

**Kayford**—The Cabin Creek Consolidated Coal Co., of which Josiah Keeley is general manager, has completed 200 new houses and will erect 60 more shortly. The store basement has been converted into a recreation room with pool tables, a barber shop, shower baths, etc.

**Ronda**—The West Branch Coal Co. will at once build 25 new houses. Entry driving is at the present time being pushed.

**Bud**—The Thermo-Pocahontas Coal Co. is finishing its development work and will begin shipping by the middle of February at the rate of about 200 tons per day. It is anticipated that this production will be brought up to 1000 tons per day by July.

**Charleston**—It is asserted on good authority that the present legislature will not pass any bills to place a further tax on coal, oil or gas. It is said that election promises in this connection will be adhered to and that when the time comes for final action on all bills not desired they will be permitted to die, probably in committee.

It has been announced that the West Virginia Coal Association will be represented Feb. 20 in Washington, during the hearing before the Interstate Commerce Commission on the Lake rate cases. The proposed increase of coal rates from the West Virginia field to Lake markets are involved.

It has been announced by Cabin Creek operators that a wage increase of 10 per cent. will be granted to the men effective Mar. 1, for the purpose of helping to meet the increased cost of living.

#### ALABAMA

**Birmingham**—At the recent session of the State Board of Examiners held in the office of Chief Mine Inspector C. H. Nesbitt there were 49 applicants which took the examination for certificates as first- and second-class mine foremen and fire bosses, of which 37 were successful. J. W. Bell made the highest grade—97 per cent.; George A. Kullum, 89 per cent., and George Husband, 87 per cent. These examinations are held semi-annually—January and July.

#### KENTUCKY

**Mater**—During a severe wind storm recently two miners' houses of the Elkhorn Coal Co. were toppled from their foundations and tumbled into Boone Creek a mass of ruins. The two families occupying the homes were given close calls. One woman was seriously hurt.

**Whitesburg**—The severe cold weather prevailing in eastern Kentucky has much handicapped grade work and preparation for opening of new mines throughout the Elkhorn coal fields. The work is delayed indefinitely.

The Acme Byproduct Coal Co. is starting the initial work of a coal development in the Boone's Fork section of this county. It will begin with a daily capacity of 500 tons.

**Providence**—The St. Bernard Mining Co. will build a commodious, fire-proof, steam-heated bath house at the Shamrock mine near here for the use of its employees. There are several hundred men employed in the mine.

**Louisa**—F. T. Hatcher, prison commissioner at Frankfort, Ky., has purchased for interests he represents, a coal boundary of Harvey Hardin on Wolfe Creek in Martin County.

**Frankfort**—The Court of Appeals has reversed a lower court decision assessing a fine of \$100 against the Elkhorn Mining Co. for permitting the sale of liquor on its premises. The company's property, in Floyd County, includes buildings which are rented, the leases prohibiting sale of liquor. Violation of the law by a tenant was followed by indictment of the company. The court holds that it is necessary to show the company knew the law was being violated.

**Bowling Green**—The Kentucky Rock Asphalt Co., recently incorporated to take over 42,000 acres of asphalt rock land, is expected to develop extensive coal deposits in Edmonson county. Railroad construction will be necessary to open up the territory, but it is stated that this field, 85 miles from Louisville, would be closest to that city of any supply in the state. M. M. Logan, Frankfort, Ky., James Garnett, Louisville, and W. C. Thomas, Pittsburgh, are incorporators of the new company.

#### OHIO

**Columbus**—Two measures for the benefit of Ohio coal interests have been introduced in the Legislature. One of these prevents any officers or stockholders of a railroad from owning stock in a mining company, and the other requiring freight from points within the state to be subject to the same rate within the state as

freight from points within the state. The latter measure is aimed at so-called discriminatory rates favoring West Virginia coal.

**Canton**—The city authorities are seriously considering leasing or purchasing a coal mine for the production of coal to sell to citizens at cost. They have inspected several mines with this object in view.

#### ILLINOIS

**Sawyerille**—A serious slide occurred a few days ago in Mine No. 2 of the Superior Coal Co. here. One miner was killed and one seriously injured.

**Medora**—A mass meeting of Citizens of Medora was held a few nights ago to consider a proposition for drilling for coal on a farm northeast of town. It has long been known that there is a stratum of coal under this section but the depth of the vein is not known. Preliminary steps to form a stock company were taken.

**Breese**—The mine of the Northern Breese Coal and Mining Co. has worked 96 hours in the month of January. The idleness was caused by failure of the Baltimore & Ohio Southwestern to furnish equipment. This is one of the large mines in this field.

**Herrin**—The coal production for Williamson Co. for January for the 14 mines of the Coal Operators Association was 409,953 tons. The largest producer here was the Chicago & Cartersville Coal Co. with 75,739 tons. There are 20 independent mines, the largest producer among them being the Big Muddy Coal and Iron Co. It is estimated that the independent tonnage was approximately 600,000 tons, so that the approximate tonnage for the county for the month of January was 1,000,000 tons.

**Duquoin**—Representatives of the Burlington Railroad Co. have been active in Perry County recently taking options, it is understood, and getting a line on the coal land situation here. The Burlington owns thousands of acres of coal rights in Franklin County, and is gradually working into Perry and Jackson Counties.

#### Personals

**J. W. Kingsbury**, of Salt Lake City, Utah, has been added to the statistical staff at the Bureau of Mines.

**James H. Scurfield**, of Somerset, Penn., has been appointed superintendent of the Markleton Coal Co.'s mines at Markleton.

**Captain H. McNamara**, agent at Hampton Roads for the Luckenbach Steamship Co., Inc., operating a large fleet of tugs, barges and steamers, has resigned.

**T. J. Hoffman**, a traveler with the Maple Hill Coal Co., has resigned to enter the jobbing business, with headquarters at 109 South Ohio Ave., Columbus, Ohio.

**John O'Connor**, formerly auditor for the Davis Coal and Coke Co., has accepted a position with the Rochester and Pittsburgh Coal and Iron Co. at Punxsutawney, Penn.

**John M. Coleman**, who has had charge of the Yatesboro, Penn. No. 4 mine of the Cowanshank Coal and Coke Co., has resigned his position to become superintendent of a large West Virginia operation.

**W. L. Batt** has been made sales manager of the Hess-Bright Manufacturing Co., of Philadelphia, and will have entire charge of its sales. Mr. Batt has been connected with this firm for many years, and did much of the pioneer work necessary to develop the industry in the United States.

**M. C. M. Hatch**, superintendent of the fuel service of the Delaware, Lackawanna & Western Railroad Co., has tendered his resignation to take effect Feb. 15. No successor has yet been decided upon. Mr. Hatch will accept a position with the Pulverized Fuel Corporation, of New York City.

**Dr. W. C. Reese** has been appointed chief surgeon for the Associated Coal Companies of North-eastern Pennsylvania, including independent mining concerns that operate 27 collieries in that part of the state. Aside from the mines a number of large industrial plants are also included in the territory and he will fill a like capacity therein.

**George S. Speese**, purchasing agent of the George B. Newton Coal Co., since the formation of that company, has resigned taking effect Feb. 3. Mr. Speese at the time of the formation of the Newton Co. was the proprietor of the Black Diamond Coal Co., one of the largest units which were used in the formation of the largest retail company in Philadelphia.

**E. B. Merriam**, for several years assistant engineer of the switchboard department of the General Electric Co., has resigned his position to assume more important duties. He now heads the Industrial Service Department recently organized to supervise education, employment, and provision of opportunities for advancement of employees at the Schenectady plant of the company.



**A. C. Ingersoll**, who has been second vice-president of the Lorain Coal and Dock Co., has resigned to enter the wholesale business at Cleveland, with offices in the Rockefeller Building. He has organized the Philadelphia & Cleveland Coal Co., with a capital of \$100,000 and will confine his efforts strictly to jobbing. A Columbus office will be in charge of O. L. Aumiller. Mr. Ingersoll is president of the new company; Henry Nelson Rose, vice-president and Lottis Ailes, secretary.

**William D. Owens**, superintendent of the Lackawanna Division of the Lehigh Valley Coal Co., for the last 25 years retired from active service on Feb. 1. He recently underwent a serious operation at one of the Philadelphia hospitals, from which he has not fully recovered. Mr. Owens was recognized as an authority on mine ventilation, and in 1913 represented the anthracite operators on the commission appointed by Governor Tenner to draw up a new anthracite code. He will be succeeded by George P. Gallagher, who has been his assistant for a number of years. Albert Browning, who has been employed as chief clerk of this division for the past ten years, received the appointment of assistant to the division superintendent. William H. Ahlers, a clerk for the company, was appointed chief clerk.

## Obituary

**Sylvester Meredith**, superintendent of a local mine in Steubenville, Ohio, was run down and killed by a New York Central train at Amsterdam during a fog on Jan. 30.

**John Leisenring Wentz**, son of John S. Wentz, head of the J. S. Wentz Co., anthracite and bituminous operators, died suddenly of heart disease, in Philadelphia recently at the age of 42 years. Mr. Wentz was prominent in the coal mining industry and also in social circles, but retired from active business several years ago on account of failing health. He is survived by a widow and two daughters.

**Benjamin Braznell**, age 86, for many years a coal operator in the Pittsburgh district, died on Feb. 1, in his home on Nepley Ave., Pittsburgh, Penn. For 26 years, until his retirement in 1907, he was active as a coal operator, and owned a number of coal properties in Washington and Fayette counties. Mr. Braznell was born in England. He came to Pittsburgh when 14 years old, and has since lived in that vicinity. His education was received in the Pittsburgh public schools. In his youth he was a bargeman. Later he worked as a miner with his father. Eventually he became a mine foreman for J. B. Corry of Braddock, then mine superintendent, and in 1881 he began as a coal operator. He was married 63 years ago. Mr. Braznell is survived by three daughters and one son, Charles W. Braznell, also a coal operator.

## Industrial News

**Macon, Mo.**—For the year ending January 31st there were six fatal accidents in the coal mines in Missouri, which is the lowest on record.

**Punxsutawney, Penn.**—John McCleavy & Co. is opening the upper vein at Anita and will use the same plant that worked the Sholler mine near the new opening. The new operation will be electrically equipped.

**Tazewell, Va.**—The Sayers-Pocahontas Coal Co., of Tazewell, has been organized with a capital stock of \$30,000. The officers are C. H. Harmon, president, H. P. Brittain, secretary and treasurer, both of Tazewell, Va.

**Cleveland, Ohio**—The Philadelphia & Cleveland Coal Co., of Cleveland, has been organized with an authorized capital of \$100,000. The incorporators are Alfred Clum, E. A. Peters, G. C. Knight, C. A. Morris, and E. N. Conrad.

**Cleveland, Ohio**—The Valley Coal Co. has been incorporated with a capital of \$20,000, to mine and sell coal. The incorporators are, C. Ridgley Thrapp, Charles B. Hunt, Mary M. Hunt, Rudolph Ehrlich and C. R. Speckman.

**Waynesburg, Penn.**—An important coal deal has been closed in Waynesburg in which the Pittsburgh Steel Co. of Pittsburgh purchased a tract of 688 acres in Cumberland township. Five hundred thousand dollars is said to be involved.

**Punxsutawney, Penn.**—The Juneau Coal Mining Co. has been organized with a capital stock of \$12,000. The incorporators are N. W. White, B. H. Beckhill and H. S. Owens of Punxsutawney, David Baup of Juneau and Murray Baum of Rosette.

**Charleston, W. Va.**—The Charleston Domestic Coal Co. has been organized with an authorized capital of \$25,000. The incorporators are J. S. McVey, G. W. Coyle of Columbus, Ohio, T. M. Boggs, J. D. Woodroe and G. B. Brooks of Charleston.

**Harlan, Ky.**—The Louisville & Nashville will build a 10-mile line of coal road up Clover Fork in Harlan Co. where a large number of new coal mining plants are billed to be started this

year. The survey for the new branch is now being made.

**Glen Jean, W. Va.**—The Calloway Coal Co. has been organized with a capital stock of \$5,000 to operate at Glen Jean. The incorporators are C. P. Calloway, S. J. Jasper, B. B. Jasper, E. G. Calloway, and A. L. Calloway, all of Glen Jean.

**Besoco, W. Va.**—The Clyde-Pocahontas Coal Co. has been organized with an authorized capital of \$50,000. The incorporators are E. E. Minter, J. B. Clifton, E. H. Turner, A. K. Minter, of Besoco, and A. W. Daubenspeck of Mullens, W. Va.

**Fairmont, W. Va.**—The Chesapeake Coal Co. has been organized, and will have its chief works in the Winfield district of Marion County. The incorporators are M. M. Foster, W. N. Peale, G. W. Mack, H. F. Smith, and Edw. L. Hawkins, all of Fairmont.

**Louisville, Ky.**—The J. B. Gathright Land Co., with capital stock of \$25,000, has been incorporated to deal in and develop coal and mineral lands in Kentucky. Incorporators are J. B. Gathright, O. H. Harrison, Matt O'Doherty, W. H. Field and J. S. Clark.

**Bradshaw, W. Va.**—The Bradshaw Pocahontas Coal Co., with an authorized capital of \$25,000 has been incorporated by A. J. McCoy and John K. McCoy of Blacksburg, Va., D. D. Hatfield, H. M. Meyers of Youkon, H. W. Perkins of Dan, also J. W. Strickler of War.

**Moorefield, W. Va.**—The Lost River Coal and Land Co., has been organized with an authorized capital of \$50,000. The incorporators are C. L. Mathias, of Mathias, W. Va., M. Dasher and F. W. Goshorn, of Moorefield, J. S. Kuykendall, and F. C. Turley, of Rodney, W. Va.

**Huntington, W. Va.**—The Zaleski Coal Co. of Huntington, with chief works at Vinton, Ohio, has been organized with an authorized capital of \$25,000. The incorporators are J. W. Hagan, C. M. Baldwin, M. M. Rothwell, H. H. Hill and J. G. Nesbitt, all of Huntington.

**Columbus, Ohio**—Offices of the Superior Coal and Dock company, owned by the Maynard coal interests of Columbus, Ohio, have been opened in the Security Building at Minneapolis. Vice-President E. E. Heiner, former Western sales manager at Chicago, is in charge.

**Clothier, W. Va.**—Immediate steps will be taken to install equipment for the development of the property in the Clothier coal district recently acquired by the Aleshire-Hardy interests. The actual locations of tipples and other improvements have not yet been decided upon.

**Williamson, W. Va.**—The West Virginia By-product Coal Co. has been organized here with chief works in Pike County, Ky. The authorized capital is \$10,000, and the incorporators are L. L. Heaton, C. B. Early, G. H. Gwinn, W. B. Beale, and J. B. Smith, all of Williamson.

**Akron, Ohio**—The investigation conducted by the city authorities to determine the cause of the coal shortage, with the cooperation of coal dealers, has virtually terminated. The conclusion reached was that the shortage was due to railroad embargoes and difficulties at the mines.

**Harrisburg, Penn.**—Governor Brumbaugh has appointed the following as the board of examiners of bituminous mine inspectors: George S. Batton, of Pittsburgh; Robert H. Kay, of Saxton; E. A. Watters, of Leeburg; William H. Gates, of Graceton; and Stephen Arkwright, of Mt. Pleasant.

**Gravity, Ky.**—The Gravity Coal Mining Co., recently incorporated to develop 230 acres of coal land, proposing an initial daily output of 200 tons, has organized, electing E. R. Short, president, Robert Lyon, vice-president; G. A. Daigle, secretary-treasurer. Joseph Kellum will be manager.

**Davidsville, Penn.**—S. E. Dickey, prominent coal operator and engineer has just closed a deal for the purchase of a tract of coal land owned by Moses Weaver. The land adjoins a tract owned by the Berwind-White Coal Mining Co., and it is understood Mr. Dickey will develop the tract of coal.

**Lackey, Ky.**—A. J. Johnson, Dr. L. S. Collins and others are organizing here for the development of the Collins coal land tract on Beaver Creek on the new branch of the Baltimore & Ohio railroad now being rapidly constructed. The new development is to be started within the next few weeks.

**Lexington, Ky.**—Lexington and half a dozen other central Kentucky towns suffered a natural gas famine during several days of the coldest weather of the winter. The pipe line from West Virginia was broken by freezing water and the supply was cut off. There was an urgent demand for coal from residents.

**Martinsburg, Md.**—The Frostburg Big Vein Coal Co. recently closed a deal with the New York Mining Co. of Mt. Savage, for a large amount of Big Vein coal at its No. 1 Mine at Allegany, near Frostburg. A plain and dump are being installed, and the mine will probably employ somewhat over 100 men.

**Ironton, Ohio**—The Kinney Farm south of Ironton has been sold to the Semet-Solway Co. as a site for the new Ironton coke and byproduct

plant. This company will begin work in the immediate future, and the plant is to be completed by July 1918. Until its completion a large force of men will be employed on construction.

**Huntington, W. Va.**—The Elkhorn Collieries Co. has been organized to mine, transport and sell coal, oil, gas and other minerals. The capital stock is \$15,000, and the incorporators are R. W. Brunk, B. L. Priddle, B. L. Williams, and H. H. Morris, of Huntington, and Sam Porter, of Lackey, Ky.

**McAlester, Okla.**—D. J. Jordan, of the Blue Ridge Coal Co. and the Sans Bois Coal Co. has closed a lease on 1000 acres of land adjoining the town of Quinton, Okla., and will begin drilling in an effort to locate a coal bed in it at once. It is said that this land is underlain with a thick bed of good coal.

**Carbondale, Ill.**—The Duquoin, Christopher & Eastern Traction Co. has been incorporated to construct and operate an electric line between Carbondale and Duquoin, through the southern Illinois coal field, passing through North City, Christopher, Buckner, Orient, West Frankfort, Elkhville, Hallidayboro and De Soto.

**Birmingham, Ala.**—Alabama railroads handling coal for export and bunker business from the port of Mobile have made application to the Alabama Utility Commission to reduce the free time for unloading such cars to five days. Ten days free time is now allowed. The case will be heard at the February session of the Commission.

**Columbus, Ohio**—Federal Judge Sater has approved the sale of 12,500 acres of coal lands in the Hocking Valley, property of the Continental Coal Co., to the New York Central Railroad Co. for \$1,300,000. By the terms of the transaction, made two weeks ago, George M. Jones, Toledo, is to be ultimate owner of the property.

**Charleston, W. Va.**—With an authorized capital of \$50,000, the Greendale Mining Co. was recently issued a charter. This firm will operate for coal in the Greendale District of Nicholas County. The incorporators are P. A. McIntyre of New Lexington, Ohio, J. F. Bedell, Henry S. Cato, I. A. Adams and Thomas A. Bledsoe, all of Charleston.

**Brownsville, Penn.**—Developments are now in progress looking to the opening of a portion of the Greene County coal field by the Pennsylvania R.R. This company will construct a line from Besco to Clarksville, where one branch will lead to Waynesburg, and another to Marianna and Hackney. The new road is to be constructed at a cost of \$3,000,000.

**Canton, Ohio**—D. P. Loomis, will head the Canton Coal Co., which has been incorporated with a capitalization of \$20,000. The company has been in operation here for two years with offices in the Martin block. The Storm-Loomis mines at Salineville are owned and operated by the company which also acts as jobber for several mines at New Philadelphia.

**Steubenville, Ohio**—J. B. McFadden, of Wheeling, W. Va., has purchased five farms in Warren Township, Jefferson County, Ohio, aggregating 1600 acres, for the purpose of conducting coal-stripping operations, and will organize a company for that purpose. The property is said to carry a rich bed of coal near the surface. Electric shovels will be used in removing the overburden.

**Blairsville, Penn.**—Corps of engineers are at work in the vicinity of Hillside plotting the new town, staking the tittle and the siding necessary to develop the large tract of coal land recently purchased by Seger Brothers of Ligonier. The new town will be located between Blairsville and Derry and it is proposed to extend the trolley line from Derry through the new coal field.

**Johnstown, Penn.**—The Winber coal fields are to be connected with the Bedford Division of the Pennsylvania R.R., according to reports from Altoona. The plan is to run a line from Inder to Ashtola about 12 mi. The output of the field will then be no longer taken through the Altoona yards. A heavy grade would be avoided and the freight rates on coal to the East would be much smaller than at present.

**Indiana, Penn.**—The Vinton Colliery Co. will start developments of the tract which it recently acquired from the Lackawanna Coal and Coke Co. at Claghorn, Indiana County, on the Black Lick to Cresson branch of the Pennsylvania R.R. The Lackawanna company started to open this field several years ago and the drifts which it opened will be used by the Vinton company. The tract contains about 6000 acres.

**Hanson, Okla.**—The Hanson Coal and Coke Co., incorporated in Oklahoma and Missouri, holding leases in eastern Oklahoma is opening a mine here. The machinery has been installed and a force of men is now sinking the first shaft. More machinery has been ordered and other shafts will be sunk. Wells that have been drilled disclose a bed of coal from 4 to 7 ft. in thickness and at depths ranging from 50 to 75 ft.

**Clarksburg, W. Va.**—Announcement was recently made that the Simpson Creek Coal Co., recently organized under the laws of West Virginia with

a capitalization of \$3,000,000 would start immediately the development of two large modern coal mines on Simpson Creek near Astor. These will be known as Galloway Nos. 2 and 3 and will be electrically operated, employing retarding conveyors and steel tripplies. A new town to be known as Galloway will also be built.

**Cincinnati, Ohio.**—The reasonableness of demurrage charges made the basis of a suit by the Cincinnati, Hamilton & Dayton R.R. Co. is attacked in an answer filed in the United States District Court by Jewett, Biglow & Brooks, West Virginia operators. The defendants allege that the tariffs under which the charges for demurrage were assessed were illegal, and that they have been duly attacked in a complaint before the Interstate Commerce Commission.

**Oneida, Tenn.**—The White Oak Coal Co. is opening a mine on the Oneida & Western R.R. low building from Oneida to Jamestown. This will be located on the Lower Stearns Seam which is 4 to 6 ft. in thickness. A slope 200 ft. long has been sunk on the coal, and the company intends to install a chain haul on this slope. A cross-over tippie and shaking screens will also be employed, and will be operated electrically.

**Chicago, Ill.**—Allen & Garcia Co. recently established a power department which will be in charge of C. M. Garland an expert on steam and gas power engineering. The electrical work in connection with this department will be handled as at present by W. C. Adams. This new power department will embrace consultation, design, construction, operation, and scientific management of power properties steam, gas, and electrical, also appraisals and reports.

**New York, N. Y.**—The Pennsylvania Coal Co. has been sued for various amounts in damages in the New York State Supreme Court by 15 former employees who were injured in the mines of the company in Pennsylvania. The suits were instituted last week in New York City, the complainants being now residents of this city. At the same time six similar suits were started against the Hillside Coal and Iron Co. The claims range from \$10,000 each to \$25,000.

**Clarksburg, W. Va.**—It was recently announced that an embargo on eastern shipments of coal to Locust Point and Jackson St. coal piers in Baltimore had been placed by the Baltimore and Ohio R.R. The embargo to Locust Point is because of improvements being made there. A new coal dump is being built that will, when completed, enable the pier to take care of about 70 additional cars per day. This pier can now handle between 120 and 160 cars of coal daily.

**Washington, D. C.**—Bankers and other representatives of investors are interested to an unusual degree in the investment possibilities of coal lands, judging from inquiries being received at the Geological Survey. While as a rule the information sought in such communications does not come within the jurisdiction of the Survey, care is taken to furnish such correspondents with all data having a bearing on coal lands in the region in which inquirers are interested.

**Johnston City, Ill.**—There are rumors afloat here that the coming season will see a new mine sunk near the north end of the holdings of the Johnston City Coal Co. This is one of the largest mines in this vicinity and has been in operation many years. The holdings to the north are extremely large, and the company a few months ago purchased the steel tippie and top works of the mine at Mt. Vernon, Ill., and it is understood that this will be used on the new shaft in the event it goes down.

**Morely, Ky.**—Eighteen hundred acres will be developed here, 3 mi. from Wallins Creek, by the Cumberland Valley Fuel and Mining Co., recently incorporated and with headquarters at 328 Grant Building, Atlanta, Ga. Remsen P. King is president, and J. W. Huffman, vice-president and general manager. The company will install a twin tippie, double incline and electric machinery, taking bids on equipment up to Mar. 1. The proposed output of the mine will range from 300 to 500 tons daily.

**St. Louis, Mo.**—In financial circles it is understood that the Chicago, Milwaukee & St. Paul R.R. will enter St. Louis through its coal connections in central Illinois, which extend within 50 or 50 miles of St. Louis on the east. In the new grouping of railroads it is expected that the Milwaukee working in connection with the Big Four will enable the Minneapolis & St. Louis to enter St. Louis over the same rails. This will open to the operators of southern Illinois some of the richest coal distributing territory in the Northwest.

**Breckley, W. Va.**—The Ragland Coal Co., recently organized with a capital stock of \$100,000 has completed its organization by electing T. R. Ragland, superintendent of the West Virginia Coal Mining Co., as president and general manager, T. E. Bibb as vice-president and J. L. Smith secretary-treasurer. A lease has been secured from the Beaver Coal Co. on 750 acres of Breckley seam, lying near Pemberton. A slope to reach this coal will be driven. Work on the development of the property will be begun at once, and it is hoped that shipments may be made next fall.

**New York, N. Y.**—The sixth annual report of the United States Steel and Carnegie Pension

Fund, applicable to the employees of the United States Steel Corporation and its subsidiary companies shows that \$711,130.33 was paid out to its beneficiaries during the year 1916. The pensioners of the H. C. Frick Coke Co. received \$72,528.51; the Hostetter Connellsville Coke Co., \$998.20, and the Tennessee Coal, Iron and Railroad Co., \$7045.95. The averages for cases, 1911 to 1916, inclusive, show: Age, 65.33 years; service, 29.93 years, and monthly pension, \$21.05. The total disbursements for the 6 years has been \$2,945,541.08.

**Boston, Mass.**—Arrangements have been completed for the opening by the First National Bank of Boston of a branch in Buenos Aires under the management of Noel F. Tribe, a banker of experience, who has resided in the Argentine for the past 20 years, and is exceptionally well versed in South American financial and trade conditions. Mr. Tribe will return to Buenos Aires at the end of February and during the coming month will be very glad to meet or correspond with those who may care to take advantage of the opportunity to discuss with him details of South American business.

**McAlester, Okla.**—Two of the four coal mines formerly operated by the Missouri, Kansas & Texas Railway Co. near Coalgate, Okla., have been reopened and the company is now mining much of the coal it consumes on this division in these mines. Preparations are being made, it is announced, to open the other two mines, and the Katy will then be in position to dispose of some of its coal for commercial purposes. The four mines will employ about 500 men. These mines have been closed for nearly three years, having been shut down on account of a disagreement between the operating company and the local union of the United Mine Workers of America.

**Washington, D. C.**—Large users of coal have become notably active during the past few months in their efforts to purchase their fuel more intelligently. Judging from the number of their representatives who have called at the Geological Survey and at the Bureau of Mines in search of information, the tendency toward scientific purchases of coal is greater than ever before. Studies are being made of coal fields, analyses of coals are being compiled and maps are being drawn containing much information of peculiar interest to the user. It is believed at the Geological Survey that the increased cost of coal has had an important bearing on this activity which is being encouraged in every possible way by the Geological Survey and the Bureau of Mines.

**Kansas City, Mo.**—Several large coal companies in the Middle West are discovering that the recent order of the Interstate Commerce Commission with reference to the return of foreign cars, is working a hardship on some districts, and creating a surplus of coal in others. Kansas City has been situated with peculiar favor in the operation of this order. Cars which might have taken coal to the South and far Southwest, have had to be sent back towards home, by way of Kansas City—and it is said that a surplus of coal is likely to exist here in a few days. Much of the coal is being worked farther east and into the northeast, but at the same time districts sadly in need of coal in the other direction are getting into worse and worse shape.

**Columbus, Ohio.**—Coal-carrying railways in Ohio will be met with the big stick of the Ohio Utilities Commission to force a better handling of the coal shortage existing in the state. This was the decision of the members of the commission when a number of tantalizing complaints were received charging lack of action on the part of the railways. Whatever force there may be in the Ohio utilities law is to be invoked at once, and to the extent the conduct of the railways make necessary, to force a better handling of the coal situation. The railways have not yet convinced the State Commission that they are doing their best to relieve the car shortage and the continuous lack of fuel distribution.

**Louisville, Ky.**—The Tennessee Jellico Coal Corporation of Louisville has taken over the properties of the Reliance Coal and Coke Co. of Cincinnati, in Perry County, Ky., and will add to the machinery equipment, proposing to increase the output from 10,000 to 20,000 tons a month. The Tennessee Jellico Coal Corporation controls the Hazard Coal Co., which is increasing its output; the Tennessee Jellico Coal Co., at Jellico, Tenn.; the Block Coal and Coke Co., at Jellico, Tenn. and has also taken over the Comargo Coal Co., at Stearns, Ky., and will begin improving the development there and increasing production. John P. Gorman, of Lexington, is general manager of the Reliance and of the Hazard companies.

**Columbus, Ohio.**—A survey of the Columbus fuel situation was started by the Ohio Public Utilities Commission, for the purpose of devising a way by which plants which are idle because of lack of gas can be given fuel and thus be enabled to operate. The Chamber of Commerce, through John A. Kelley, manager of its industrial bureau, made the request for the survey, and the commission immediately instructed its inspectors to begin one, which will be similar to the survey made by the commission in Cin-

cinnati, which afforded much relief. Under a ruling of the commission, gas companies were directed to curtail the supply furnished consumers who receive more than 200,000 cu. ft. of gas a month during cold weather, so as to insure fuel enough for domestic use.

**Pittsburgh, Penn.**—Announcement has just been made by the Westinghouse Electric and Mfg. Co. that the plot of ground recently purchased at Essington, near Philadelphia, will form a new industrial center for the Westinghouse interests. The site embraces about 500 acres, with a frontage of approximately one mile on the Delaware River. Additional transportation facilities will be afforded by tracks from the Pennsylvania and Philadelphia & Reading railroads. This new center will be devoted to the production of large apparatus, the first group of buildings being for power machinery, principally steam turbines, condensers, and reduction gears. The initial development will cost in the neighborhood of \$5,000,000 or \$6,000,000 occupying about one-fifth of the area of the entire plot.

**Chattanooga, Tenn.**—The Nashville, Chattanooga & St. Louis R.R. has equipment on the ground to begin construction of an extension of the Tracy City branch of the system from Coalmount in a northeasterly direction to Mill Creek, near Tatesville. The extension will be 13 mi. in length and will open 25,000 acres of coal-bearing land. The coal is of the Shawnee vein, said to be harder than that mined at Tracy City or Whitwell. The mines to be developed as a result of the extension will be operated by the Tennessee Consolidated Coal Co., which proposes to begin its development work at once. The mines of the company at Tracy City have been operated since 1858 and the average daily output for this period has been 800 tons. A still larger tonnage will be produced, it is stated, at the new developments.

**Washington, D. C.**—Separation of large coal and railway properties in West Virginia heretofore owned by the Coal and Coke Railway Co. and the Davis Colliery Co., was announced here by C. M. Hendley, secretary of the Coal and Coke Railway. The Roaring Creek & Bellington R.R., formerly owned by the Davis company and leased to the Coal and Coke company has been acquired by the latter, of which Charles D. Norton of New York is the new president. The West Virginia Coal and Coke Co. of Elkins, a new corporation, of which John L. Kemmerer of New York is president, will take over the coal lands and collieries of the Davis company and of the Coal and Coke Ry. The readjustment was effected mainly through the estates of the late Henry Gassaway Davis, Richard C. Kerens and Stephen B. Elkins.

**Lisbon, Ohio.**—The Kirk-Dunn Coal Co., which operates extensive coal mines at West Point, will within the coming year operate just as extensively northwest of Lisbon in the vicinity of Coleman. The company has acquired a large area of coal underlying farms in this vicinity, and John Suffill and James Stuckman, experienced mine workers of Lisbon, have undertaken the work of opening the entrance to the mine. This will be on the opposite side of Beaver creek from Coleman, and it will run back through the hill, probably two miles, to the coal underlying the Rudisill and Samuel Bye farms. The company already owns the coal underlying these farms, in addition to that underlying the Philip Bowman and the Floding, formerly the Herman Minehart farms. Just as soon as the mine can be opened, extensive operations will begin.

**Philadelphia, Penn.**—The Pennsylvania R.R. Co. it is reported has finally succeeded in disposing of its large holdings of anthracite properties in Luzerne, Northumberland, Schuylkill, and Dauphin counties. Effort to sell land held through the Susquehanna Coal Co. was started about 3 years ago following the passage of a Federal act making it illegal for a railroad to hold direct or indirect interest in a commodity which it transports. Under the agreement made the Delaware & Hudson Co. will take over the Susquehanna company as soon as legal negotiations may be completed. It is understood that payment will be made through purchase obligations maturing serially over about 20 years. The price paid will be between \$8,000,000 and \$12,000,000. It is estimated that the land controlled by this company contains fully 90,000,000 tons of coal.

**St. Louis, Mo.**—The car shortage situation in the Illinois coal fields at the present time is worse than at any time since last August. Less than 20 per cent. equipment is being furnished on such roads as the C. & E. I. C., and Iron Mt. in the high grade field. The C., B. & Q. has about 60 per cent. In the Standard field the M. & O. has less than 10 per cent., the Southern about 30 per cent., and the other lines with the exception of the B. & O. run about the same percentage. The B. & O. at the present time is in the worst shape of any of the inner field roads excepting the M. & O. The Suburban Ry., St. Louis and O'Fallon Ry., the Litchfield & Madison, and St. Louis, Troy & Eastern are furnishing from 75 to 90 per cent. equipment to the mines on their lines. The above four roads represent what is known as the short line coal roads upon which St. Louis depends for its fuel.



# Market Department

## GENERAL REVIEW

**Anthracite** quiet but prices continue firm. Foreign complications upset the bituminous market at tidewater. Movement slow and supplies very short at some interior points. Shortage very acute in some sections of the Middle West.

**Anthracite**—The market continues strong though there is an absence of the very urgent buying that has so recently characterized the situation. In the domestic trade some of the individual operators are occasionally seeking orders at prices they would not have considered a few weeks ago. Stocks are admittedly light, but with only more or less intermittent buying to be expected over the balance of the season, dealers are very backward about coming into the market for any considerable tonnages at the prevailing levels. Shipments to outlying districts continue unsatisfactory, due to the heavy congestion of all kinds of freight and any further serious interruption to transportation, such as might be occasioned by a protracted and severe snowstorm, would undoubtedly result in a famine at some points. Contracting is coming in for considerable attention, individual operators at New York having covered about a quarter of a million tons of buckwheat No. 1 at \$3 per ton, an advance of \$1.25 over the old figure. As was expected the new circular of the anthracite companies, which omits quotations on the smaller sizes, has resulted in advances on these grades.

**Bituminous**—The Coastwise situation has been completely upset by the foreign complications. The Government has issued orders that Navy requirements must be given the right of way over all other business, and the prospects of a considerable extra demand from this source, together with the probability of the withdrawal of numerous colliers for naval service, has made it impossible for shippers to find where they stand. Exporters are doing practically nothing, owing to prohibitive freight rates and high insurance, while bunker demand has declined very sharply, though with the generally heavy consumption and severe cold weather at the opening of the week, the effects of these losses were scarcely perceptible. The stormy weather has delayed the movement and interfered with operations in the mining regions; it has also frozen the coal at tidewater and increased the difficulties in handling, causing delays in loading vessels especially at Hampton Roads. There have been no important developments in contracting, the dominant note being a waiting attitude on the part of both buyers and sellers.

**Ohio Valley**—The severe cold weather has stiffened up the market in the Pittsburgh district, causing a complete recovery from the recent decline. The low temperatures have also interrupted the movement, and are liable to create serious conditions at some points. This is particularly the case at Canadian centers where a great many manufacturers are working on very narrow margins, and may be forced to suspend operations at most any time. Railroad embargoes against most classes of freight other than coal and food have tended to relieve the situation in isolated instances. As a rule, the car situation is the worst of the season, while there is a big extra demand for emergency supplies and further complications have been caused by the railroads confiscating coal. Contracting is progressing slowly, consuming interests hesitating to cover their requirements for a year at the exceptionally high price level. The Berwind-White Co. has announced a contract price of \$3.50 per gross ton at the mine, which is regarded in line with the Pittsburgh district price of \$3 per net ton, announced some time ago.

**Middle West**—The record-breaking storms and low temperatures over last week end wiped out the various indications of the customary spring slowing down which were beginning to appear. Severe car shortage and congestion at terminal points again attained to alarming proportions, and were further contributing factors in the situation. In addition, some of the roads have been compelled to confiscate coal almost indiscriminately, while others have also found it necessary to annul passenger service on occasions. Some Illinois mines are making record-breaking shipments into the Northwestern territory, where a precarious condition is developing, due to the slow movement occasioned by the severe weather. Dock supplies are practically exhausted, and there is pronounced nervousness over the outlook.

**A Year Ago**—Break in anthracite narrowly averted by the return of lower temperatures. Spot bituminous softer and prices indeterminate. Ocean freights touch new high level. Heavy demand for slack at interior points. Firm conditions prevail in the Middle West.

## Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	Feb. 10	Feb. 3	Jan. 27	Jan. 20	Jan. 13
Clearfields.....	*\$1.75@2.10	\$4.60@5.15	\$4.50@4.25	\$4.75@5.60	\$4.75@5.60	\$4.75@5.60
Cambrias and Somersets..	*2.15@2.50	4.85@5.50	4.90@5.50	5.00@6.25	5.00@5.65	5.00@6.00
Pocah. and New River <sup>1</sup> ..	2.80@2.90	6.50@6.75	6.50@6.75	6.50@7.00	6.50@7.00	6.75@7.25
Philadelphia						
Georges Creek (Big Vein)	3.10@3.25	5.75@6.00	5.75@6.00	6.00@6.25	6.00@6.50	6.50@6.75
W. Va. Freeport.....	*1.80@1.90	5.00@5.15	5.00@5.15	5.00@5.25	5.25@5.50	5.75@6.00
Fairmont Gas mine-run <sup>2</sup>	*1.80@1.90	5.25@5.50	5.25@5.50	5.25@5.50	5.25@5.50	5.50@5.75
Pittsburgh (steam coal) <sup>2</sup>						
Mine-run.....	*1.35@1.45	4.95@5.05	4.70@4.80	4.50@4.75	4.25@4.50	4.00@4.25
2-in.....	*1.40@1.50	4.95@5.05	4.70@4.80	4.50@4.75	4.25@4.50	4.00@4.25
Slack.....	*1.30@1.40	4.70@4.80	4.40@4.60	4.00@4.00	3.75@4.00	3.85@4.00
Chicago (Williamson and Franklin Co.) <sup>2</sup>						
Lump.....	*1.65@1.75	3.75@4.00	3.75@4.00	3.75@4.00	3.50@4.00	3.75@4.00
Mine-run.....	*1.40@1.50	3.00@3.25	3.25@3.50	3.25@3.50	3.00@3.50	3.50@3.75
Screenings.....	1.00@1.10	3.00@3.25	3.25@3.50	3.25@3.50	3.00@3.50	3.50@3.75

Gross average<sup>3</sup>.....\*\$1.73@1.91 \$4.70@4.95 \$4.66@4.86 \$4.64@5.03 \$4.54@4.98 \$4.74@5.11

<sup>1</sup> F.o.b. Norfolk and Newport News. <sup>2</sup> Per net ton. <sup>3</sup> The highest average price made last year was \$4.80@5.33 made on Nov. 25.

\* Price lower than the week before.

† Price higher than the previous week.

## BUSINESS OPINIONS

**Dun**—With the new international complications accentuating the tendency toward conservatism and caution, legitimate business hesitates, though its volume continues large. Foreign uncertainties influence all speculative markets adversely, and in trade and industry there is an increasing disposition to defer forward commitments until the future is more clearly defined. Yet the effect of the abatement of buying is lessened, with most mills and factories covered by contracts for months to come, and leading producing interests do not offer price concessions in an effort to stimulate demand. Commercial failures this week are 325, against 333 last week, 358 the preceding week and 469 the corresponding week last year. Signs of yielding, however, are more apparent, and sharp reaction has occurred in some raw materials, such as in cotton. Headway is made in reducing orders that have accumulated in many branches, but progress in this direction is still slow because of the handicaps imposed by the transportation congestion and inadequate labor supply. With freight movements generally retarded and embargoes in force, certain commodities are more scarce and costly and premiums have not entirely disappeared.

**Bradstreet**—Distribution by retail dealers has been animated by cold weather over a wide area, and in consequence reorders for winter goods expanded. Incidentally, visiting buyers through the leading markets, thus increasing house trade in spring fabrics. Industrial lines manifest activity, but the shortage of railway facilities, made worse by cold weather, which has hampered train service in numerous sections of the West and Northwest, restricts receipts as well as outbound shipments. Indeed the car situation has caused the closing down of lumber mills in the far Northwest and in parts of the South, while resulting in uncertain supplies of fuel for the large industries. Foreign inquiries for steel are as numerous, if not more numerous, but domestic interest in steel, pig iron, copper, lead and tin has been upset by the outlook as respects our international relations.

**Dry Goods Economist**—Prominent commission houses say that while securities and cotton and other speculative staples will be affected by the break with Germany, the market for textiles was sold so far ahead that they look for no important developments from a price standpoint. As a matter of fact, cotton underwent a record-breaking decline on the New York Exchange, the May option dropping over 5c. a pound, though much of the loss was recovered, the option at closing 15.14. There is evidence of a general willingness on the part of buyers to make purchases.

**Marshall Field & Co.**—Wholesale shipments of dry goods for the current week are running about even with the corresponding period of a year ago. Road sales for immediate and fall delivery surpass the same period of last year by a good margin. Customers have visited the market in larger numbers than in the week a year ago. Practically every merchant reports an exceptional retail distribution for the month of January and the opinion seems to prevail that the excellent volume of retail distribution during 1916 will be maintained for some months to come.

## Contract Prices

**Boston**—The situation is very unsettled, as a result of the international complications, though consumers continue confident that the \$4.75 base price will not be maintained. Pennsylvania interests that withdrew quotations a month ago show no inclination to reopen negotiations. Business so far is restricted largely to export and bunker trade, and large buyers are finding operators very guarded against commitments. With the possibility of the withdrawal of a large number of colliers in event of a naval demonstration, agencies having transportation are not inclined to bind themselves on coastwise business.

**Hampton Roads**—Contract prices continue at \$4.75 per gross ton for coastwise and export, \$3 per net ton f.o.b. mines for line trade and local delivery, and \$5 per gross ton plus 15c. trimming for bunker coal.

**New York**—Contracts involving 250,000 tons of buckwheat No. 1 were closed this week at \$3 at the mines, an advance of from \$1.25 to \$1.50 over last year's prices. It is said that the new prices for buckwheat No. 2 will be \$2.25, an advance of 75c., and for buckwheat No. 3, \$1.75, an increase of \$1. Two contracts aggregating from 2500 to 3000 tons of bituminous coal were closed at \$3.25 at the mines. City officials rejected proposals of \$7.95 and \$8.45, respectively for two lots of buckwheat No. 3 coal of 2000 tons each, claiming they can do better in the open market.

**Philadelphia**—Contract figures are nominally on the basis of \$3.50 for the best grades, though we have heard of quotations as low as \$2.75 being offered. Bituminous producers are showing more of a tendency to press for business. A number of the individual anthracite operators have covered a good proportion of steam sizes at substantial advances over last year.

**Lake Freights**—The fact that some contracts have been closed at 45c. to Lake Superior ports and 50c. to Lake Michigan docks has not fixed the season's rates on this basis, as is evidenced by the offers of 50c. for Lake Michigan cargoes by a large shipper. Some contracts are being covered subject to whatever price may be asked as the season's basis.

**Pittsburgh**—The Berwind-White Co. has announced that it will cover 50% of its old contracts at \$3.50 per gross ton, f.o.b. mines, for the twelve months which is close to the \$3 per net ton price previously quoted in this column for Pittsburgh district coal. Several contracts have been closed for byproduct coal at \$3.15 for the twelve months beginning Jan. 1, which is regarded as cheaper than the \$3 price for the twelve months from Apr. 1. The \$3.50 price for 2-in. gas coal is regarded as too high by consumers. Negotiations on contracts are proceeding more slowly than operators anticipated.

**Buffalo**—The bituminous contract situation is very strong. Jobbers had been making a few contracts on the basis of \$3 to \$3.50 for Yough-

logheny and as high as \$2.60 for No. 8, but the operators are not anxious to make figures as low as that and jobbers here will not insist on them any longer, as there are letters from mining centers this week advising withdrawal of all contract prices till the effect of the war situation is better known. The belief is that this will advance prices.

**Cincinnati**—New contracts are quoted at \$2.50 to \$3.50, but there is little business being negotiated, and not much is expected before the latter part of March.

**Louisville**—Little of a definite character has developed on contracts in this section, but current indications are that the price for the twelve months from April 1 will be about \$2.50.

**Chicago**—Southern-Illinois mines have closed a contract involving 10,000 tons of 2-in. screenings for shipment to the Carnation Product Co. at \$1.60 per ton. An entirely new piece of contract business is a 60,000-ton contract for 3/4 in. screenings from Franklin County for shipment to the Egyptian & Peninsular Cement Co. in Michigan.

**Birmingham**—A railroad contract was closed recently at an advance of 45c. over the old price.

## Atlantic Seaboard

### BOSTON

Contract sales still confined to a few distributors. The Hampton Roads shippers apparently aloof from coastwise trade, especially those with foreign connections. Pennsylvania grades show no material change. Anthracite shipments much hampered by slow movement of railroads to Tidewater.

**Bituminous**—The Pocahontas and New River agencies have not yet made any general canvass for contract business. Responses are few and slow when large buyers seek proposals and all are so guarded about commitments that it is very difficult to forecast what the shippers will do eventually. For the present sales are restricted largely to the export and bunker trade. Most of the interests are short of coal for current demands and so long as this continues there is likely to be very little anxiety about placing future tonnage. Meanwhile, there are large re-handling plants in New England making deliveries on 1915 sales that are without an order beyond Apr. 1. The only factors who are in position to name prices are those who have transportation, and having transportation they are in doubt whether to bind themselves for its use along the coast.

The uncertainty is added to by war possibilities and the likelihood that almost any form of naval demonstration will withdraw a number of colliers from trade.

The feeling has been general among manufacturers in this territory that the \$4.75 base price will not be maintained, though it is admitted that water-freights are to be high. There is little real encouragement for buyers who face the market squarely. The f.o.b. price is about the only feature on which there can be any substantial reduction and unless export demand is disappointing the chance of a lower basis is somewhat remote.

Distributors of the Virginia coals inland from Tidewater are in most cases refusing to quote season prices. At many points the prices mentioned all-rail lead buyers to think that water coal must soften but when all-rail prices are still further withdrawn there will probably be a different attitude.

Retail distributors are in a hard position as to price. The present level of \$8 per net ton in Boston will have to be raised if the season contract quotations stay on the present basis. The public will feel that an advance of nearly 100% over a year ago is rather drastic.

Shippers and consignees both are buying small lots of spot coal to clear ships, and on such purchases about \$6.50@6.75 is asked. There are shippers with relatively small tonnage who are trying to place f.o.b. coal in the open market but so far the takers are confined to those interests who own transportation.

The Georges Creek shippers show no inclination to take contracts. Their transportation is insufficient to satisfy present requirements and no quotations are likely to be made until arrears are more nearly made up.

Pennsylvania operators are still struggling with labor uncertainties and irregular car supply. The latter is slowly improving but interests which withdrew 1917 prices a month ago are showing no inclination to reopen the subject of extended delivery. Spot coal is in such demand that with output very hard to gauge it is plainly the safer course to sell from time to time as coal is available.

At Philadelphia the volume of steam coal standing is relatively very small. There have been several instances the past fortnight where New England buyers with boats on hand at desirable rates have been unable to secure cargoes. As to the future the Pennsylvania operators are as reticent as those in West Virginia.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. and Somerset
Philadelphia.....	\$5.85@6.50	\$6.10@6.75
New York.....	6.10@6.75	6.40@7.10
F.o.b. mines.....	4.60@5.15	4.85@5.50
Alongside Boston (water coal).....	8.25@8.50	8.60@8.75

Pocahontas and New River are quoted at \$6.50 @6.75 f.o.b. Norfolk and Newport News, Va., for spot coal, \$9@9.25 on cars Boston and Providence for inland delivery. On contract Apr. 1 to Apr. 1 \$4.75 is quoted f.o.b. Hampton Roads, but the \$7 price on cars Boston is confined to only one distributor and by that distributor only to consumers who are now taking coal from the same source.

**Anthracite**—Loadings at Philadelphia and New York are still very slow. The railroads are apparently unable to give adequate service in moving coal to Tidewater. The volume of other traffic is so great that anthracite dribbles through in most discouraging fashion. Barges are held up a week at a time waiting cargoes and the assortment of domestic sizes available is irregular and unsatisfactory.

Dealers in this territory have only light stock and appear less and less anxious to pay premiums. A blocking snowstorm or a fortnight of continued hard weather might create a serious local situation. It has to be said, however, that the public generally is so well aware of possibilities that it has been more forehand than usual.

### NEW YORK

Contracting for anthracite steam coals under way with prices nearly doubled. Buckwheat grades scarce and quotations high. Domestic grades short but individual coals easier. Bituminous demand slow and prices softer. Buyers hesitating over new contracts. Loaded boats in demand.

**Anthracite**—Interest in the anthracite situation is centered on the steam coals. The first of the week there were less than a dozen cargoes available in the harbor and one dealer stated that he did not believe there were 1000 tons of buckwheat No. 1 to be had here at any price. Buckwheat No. 2 was also out of the market in most cases and quotations were hard to get. Barley was a trifle easier but prices were firm.

Large users of buckwheat No. 1 are looking into the contract situation with a view of closing up for next year's supply. Contracts aggregating 250,000 tons have been signed up by individual operators at a price of \$3 at the mines, an advance of from \$1.25 to \$1.50 over the existing contract price. The new contract price for buckwheat No. 2 is said to be \$2.25, an advance of 75c. and for buckwheat No. 3, \$1.75, an advance of \$1 over last year's price.

Proposals for furnishing one of the city department with two lots of buckwheat No. 3, of 2000 tons each, were made at \$7.95 per ton for delivery in Manhattan and \$8.45 for delivery in Brooklyn. Both bids were rejected the city authorities believing they can buy cheaper in the open market.

The domestic sizes continue in good demand but dealers hesitate about paying the existing prices for individual coals and the companies have not sufficient coal to supply the wants of their regular customers. Supplies are short owing to the delays in mining.

Egg and stove sizes are the shortest with chestnut a trifle easier both in supply and price. Line trade continues good and stocks are light everywhere, some large dealers in nearby inland cities having less than a couple of days' supply on hand.

Pea coal is hard to get at Tidewater at any price, while quotations for the better grades are as high as for some grades of chestnut.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$4.95	
Egg.....	5.45	\$7.50@8.00
Stove.....	5.70	7.50@8.00
Nut.....	5.75	7.25@7.75
Pea.....	4.00	6.75@7.00
Buck.....	2.75	6.25@6.75
Rice.....	2.20	4.50@5.00
Barley.....	1.95	3.00@3.25
Boiler.....	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

**Bituminous**—There has been a further decline in the market notwithstanding favorable conditions for heavy consumption. Supplies are short and storms have resulted in frozen coal, making loading slow. Loaded boats are in good demand with prices on a higher basis than for the same grades at the piers. Several of the docks were practically at a standstill early this week owing to the storm.

The falling off in the demand for bunker coal has not been reflected in the market as yet. The supply is so short that even with fewer ships sailing, delays of from 24 to 48 hr. were the rule. Some vessels were sent from here to Newport News to load coal for Southern points.

Car supply shows no improvement, and the local piers remain free of embargoes. Operators are firm as to their contract prices but con-

sumers are hesitating. Exporters are doing practically nothing as freight rates are prohibitive and marine insurance has more than doubled.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	Port Reading	South Amboy	Mine Price
George Crk.....	\$7.00@7.25	\$7.00@7.25	\$5.25@5.50
Big Vein.....	6.50@6.75	6.50@6.75	4.75@5.00
Tyson.....	6.00@6.50	6.00@6.50	4.25@4.50
Clearfield.....	6.50@6.75	6.50@6.75	5.00@5.25
South Frk.....	6.50@6.75	6.50@6.75	5.00@5.25
Nanty Glo.....	6.00@6.50	6.00@6.50	4.00@4.25
Som'r. Co.....	6.50@6.75	6.50@6.75	4.75@5.00
Que'ho'ing.....	6.25@6.50	6.25@6.50	4.00@4.25
W. V. Fairm't.....	6.25@6.50	6.25@6.50	3.75@4.00
Th'r'qua.....	6.00@6.50	6.00@6.50	3.75@4.00
Mine-run.....			
West. Md.....			

### PHILADELPHIA

Anthracite shows slight easing up, but demand still strong. Premium prices decline. New price circular causes comment. Bituminous again stronger after easing off. Severe weather closes mines.

**Anthracite**—The orders on hand are as heavy as ever, though the first signs of easier conditions are in evidence. However, the change is very slight and is chiefly noted in the absence of the frenzy that marked the buying of a month ago. Egg, chestnut and stove are easier at prices 50c. to 75c. off from a few weeks ago. Pea and the smaller sizes are as strong as ever.

The smaller operators are occasionally seeking orders for a few cars of family sizes at figures they would have ignored a few weeks ago. It must not be understood that any of the sizes are in plentiful supply locally, but neither egg nor chestnut are quite so active, especially chestnut. Stove will probably show no falling off until warm weather. Pea has continued strong and the demand is out of all proportion to the supply. A number of the smaller dealers have had none of this size for as long as three weeks at a time, while others have gone into the market and offered premiums which they charged to the consumer and we have heard retail quotations of as high as \$6.50 on this size. Dealers who a week or two ago had the opportunity of buying Lykens Valley pea at an advance of 45c. to 75c. over the white ash circular, ordered with an abandon that soon covered the available supply.

The demand for the steam sizes is as great as ever, but it is predicted by some that conditions may soon undergo a radical change. It is known that a number of the smaller operators have already closed contracts on a good proportion of their production of these sizes and at figures very much in advance of those prevailing last year.

As we announced last week, the largest operating company issued a new price circular, but the only change is the elimination of quotations on lump, steamboat, broken and buckwheat sizes. This is the first time in the history of the company that their circular fails to show prices of these grades. The addition of the clause at the bottom of the circular "Prices on other sizes on application," would seem to indicate that the company expects an increase on these grades. Considering the greatly increased prices being obtained for bituminous coal, as well as the high rates obtained by the individuals on buckwheat, they are certainly justified in this.

On inquiries to various of the larger companies for prices on buckwheat to transient trade the quotations have varied from \$2 to \$2.50 as compared with the former circular price of \$1.65. These quotations were made to retail dealers who take care of steam trade that cannot be reached direct by railroad delivery. Based on these quotations the new contract figure on No. 1 buckwheat will not be less than \$2.25 or even more. Despite the increased figures the larger companies are almost flooded with inquiries from manufacturing plants desiring to turn from bituminous coal to anthracite. All the other steam sizes have also been subjected to proportionately increased quotations.

Retail men are anxious for spring, as that is the only way they see out of their troubles, although even the threatened war may prevent that. As for the selling agents it has been a long and tedious season, especially for those of the larger companies who had to undertake the hopeless task of supplying their trade at circular prices. No dealer can be found who thinks he was given his share of coal and many feel slighted and neglected. At this time railroad deliveries show little or any improvement, and the car supply is also very unsatisfactory.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line Tide	Line Tide
Broken.....	\$4.25 \$5.40	Buck..... \$2.50 \$3.40
Egg.....	4.15 5.25	Rice..... 2.10 3.00
Stove.....	4.10 5.60	Boiler..... 1.95 3.15
Nut.....	4.50 5.55	Barley..... 1.85 2.05
Pea.....	2.80 3.70	

**Bituminous**—There have been numerous fluctuations in soft coal recently. For a time it



seemed that the prices would recede gradually to within the \$3.50 figure for spot coal, judged by the continued slight decreases over a period of several weeks. At the opening of the present week the cold became so intense that many of the mines suspended for two days, as the men refused to turn out. In addition a snow storm which accompanied the cold wave impeded rail movement somewhat, while the impending difficulties with Germany, caused the market to stiffen quite perceptibly.

As a consequence prices at this time have regained much of the ground lost last week. As a matter of fact many shippers are chary about quoting prices, feeling that conditions are such that there may be a quick upturn at any time.

There is no lessening in contract negotiations, although most of the business closed now will date from Apr. 1 on both bituminous and anthracite. On the former the price of \$3.50 for the best grades still prevails, although we have heard of quotations as low as \$2.75 being offered. There seems now a greater tendency on the part of producing interests to press for contract business.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein.....	\$5.75@6.00
South Fork Miller Vein.....	5.50@5.75
Clearfield (ordinary).....	5.15@5.25
Somerset (ordinary).....	5.15@5.25
West Va. Freeport.....	5.00@5.15
Fairmont gas, lump.....	5.50@5.75
Fairmont gas, mine-run.....	5.25@5.50
Fairmont gas, slack.....	4.50@4.75
Fairmont lump, ordinary.....	5.00@5.25
Fairmont mine-run.....	4.75@5.00
Fairmont slack.....	4.50@4.75

#### BALTIMORE

Over supply of bituminous quickly cut by storm and lessened car distribution. Anthracite boomed by cold wave. Supplies only moderate.

**Bituminous**—The early part of the past week again saw the terminals here filled with loaded coal cars. Much of this coal was unattached and had to be absorbed in the local market. Purchasing at the lower prices recently quoted here was heavy, as nearly all consumers are now buying in the spot market and waiting until April to contract for the year period. Car supply in the West Virginia and Maryland coal fields dropped off from 70 and 80% to 30 and 40%.

A number of operators came to the city during the week to urge a more liberal distribution. On top of this came a cold wave and snow. Zero and less temperatures prevailed along B. & O. and Western Maryland lines. Frozen coal at tide gave much trouble.

Prices at tide are about on an average with mine offerings. Prices at the mines to the trade are about as follows: Georges Creek Tyson, \$4.50; Quemahoning, \$4.25; South Fork, \$4 to \$4.25; Somerset, \$4; Clearfield \$3.75 to \$4; Freeport, \$3.50; Fairmont gas, three-quarter, \$3.75 to \$4; same, run-of-mine and slack, \$3.75.

**Anthracite**—Low temperatures in Baltimore sent many small purchasers hustling for coal. Stove was again in most active demand and stocks rather low. Movement from mines to yards about maintained recent averages, which have been sufficient to prevent any real shortage.

**Exports**—Under the German submarine threat, the export business suffered another slump. But one cargo, for Tampico, was loaded here during the week, a total of 1295 tons. One export coal and two export coke cargoes were announced.

#### HAMPTON ROADS

Prices slightly easier for spot business. No contracts reported closed. Coldest weather in 18 years causes slow loading.

Free coal for spot delivery shows a slight recession from recent prices but not to any appreciable extent. This falling off may be more than regained shortly by the Navy Department calling for heavy deliveries. Shippers who are under contract to the Government have been notified that the Navy requirements must be taken care of regardless of other contracts. The tonnage under contract may not be sufficient for the immediate needs of the Navy, and, if such proves to be the case, orders will no doubt be placed with other shippers.

It would seem that spot prices for commercial business are bound to increase on account of the anticipated heavy demands. The apparent apathy of shippers regarding business after Apr. 1 is easily understood in the face of present market prices, but the reason for the indifference of the consumer is not so evident.

The coldest weather experienced at Hampton Roads in 18 yr. has caused the coal to become frozen in the cars. There are no facilities for thawing, on account of the weather seldom being cold enough, and consequently there is great delay in getting the coal out of the cars. The car dumper has to turn the road car over several times to get all the coal out. As a result of loading delays vessels have accumulated and all the terminals are badly congested by waiting vessels.

It is possible that after this week the Government will forbid the publication of vessel clearances. The American-Hawaiian Liner "Panama," which loaded recently a cargo of coal for Buenos Aires, also took \$500,000 in gold coin.

The latest addition to the fleet of steamers of Castner, Curran & Bullitt, Inc., the "Tidewater," loaded her first cargo on Feb. 3 at Sewalls Point for Boston. The deadweight capacity of this steamer is some 8650 tons, cargo and bunkers.

Local dealers report temporary activity in anthracite due to the unusually severe weather. Spot prices for Pocahontas and New River run-of-mine for coastwise and foreign shipment are \$6.75@7 per gross ton; for local delivery on track \$6@6.50 per net ton; bunker coal \$7 per gross ton plus 15c. per ton trimming. Contract prices are \$4.75 per gross ton for coastwise and export, \$3 per net ton f.o.b. mines for line trade and local delivery, bunker coal \$5 per gross ton plus 15c. trimming. Anthracite is quoted at \$9 per net ton delivered.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Jan. 13	Jan. 20	Jan. 27	Feb. 3
Nor. & West.....	111,316	137,103	138,413	84,162
Ches. & Ohio.....	118,613	103,335	81,835	103,279
Virginian.....	69,372	85,661	111,799	77,154
Total.....	299,301	326,099	332,047	264,595

Dumpings for the month of January, 1917, were as follows, in gross tons: Norfolk & Western Ry., 551,353; Virginian Ry., 340,177; Chesapeake & Ohio Ry., 464,649; total, 1,356,179. January tonnage shows an increase of some 100,000 tons over December, the principal gain being made by the Norfolk & Western.

## Ocean Shipping

#### VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

#### NORFOLK

Vessel	Destination	Tons
Jungshoved <sup>5</sup>	Barbados, B.W.I.	5,781
Cibao <sup>3</sup>	Kingston, Jamaica	1,157
Atlantid <sup>1</sup>	Genoa, Italy	8,516
Amelia <sup>1</sup>	St. Georges, Bermuda	1,006
Edwin G. Farrar <sup>3</sup>	St. Georges, Bermuda	798
Panaman <sup>6</sup>	Buenos Aires, A. R.	7,307
Lewis K. Thurlow <sup>7</sup>	Banes, Cuba	2,500
Arizonan <sup>5</sup>	Rio de Janeiro	11,320
Cristobal <sup>1</sup>	Cristobal, C. Z.	6,873
Iquitos <sup>5</sup>	Callao, Peru	125
Giuseppe, G. <sup>1</sup>	Genoa, Italy	4,694
Huftero <sup>5</sup>	Havana, Cuba	1,967
Elizabeth Maersk <sup>8</sup>	Dagua, Cuba	2,284

#### NEWPORT NEWS

Henry F. Kreger <sup>3</sup>	Huelva, Spain	1,782
Ellen Little <sup>2</sup>	Ponce, P. R.	1,257
Suffolk <sup>2</sup>	Rio de Janeiro	6,607
Wilb. Colding <sup>2</sup>	Antilla, Cuba	2,122
Tordenskjold <sup>2</sup>	Fort de France	5,406
Thorgerd <sup>2</sup>	Havana, Cuba	3,598

#### BALTIMORE

Moerdyk	Tampico	1,295
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#### PHILADELPHIA

Bratland	Havana	1,900
Nordland <sup>2</sup>	Havana	
Theodora	Piraeus	
Henry T. Scott <sup>2</sup>	San Domingo	

<sup>1</sup> Pocahontas Fuel Co. <sup>2</sup> Berwind-White Co.  
<sup>3</sup> Castner Curran & Bullitt. <sup>4</sup> Baker-Whiteley Co.  
<sup>5</sup> Smokeless Fuel Co. <sup>6</sup> Virginia Coal Co.  
<sup>7</sup> Crozer Pocahontas Co. <sup>8</sup> C. G. Blake & Co.

#### OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

#### PHILADELPHIA

Vessel	Destination	Tons	Rate
Nordland	Havana	1,900	

#### NORFOLK

Dunayre <sup>1</sup>	Mexico		
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#### VIRGINIA

Isabel B. Wiley	Brazil	611	\$17.00
Wagama	Rio Grande-do-Sul	2,600	

#### HAMPTON ROADS

Olaf	St. Lucia	1,194	9.00
Margaret L. Roberts	Para	850	14.00

#### BALTIMORE

Blaamyra	Santos	1,446	
Polario	Chile	2,352	
Sherman	Chile	2,228	

<sup>1</sup> And coke.

#### NEW YORK EXPORTS

During the 12 months ended Dec. 31, 1916, there were exported from the port of New York 204,327 tons of anthracite coal valued at \$1,155,982; 42,302 tons of bituminous coal, valued at \$170,976, and 18,872 tons of coke valued at \$147,011.

#### OCEAN FREIGHTS

Since last report, very few charters were effected for export coal, and none of these fixtures were reported. The present crisis in international affairs is causing both owners and charterers to hesitate before entering upon new commitments; we hope, however, in the near future that trade will adjust itself to the altered conditions, and chartering move more smoothly.

We would quote freight rates on coal by steamer as follows:

	Jan. 29	Feb. 5
Europe		
West Coast Italy.....	\$48.00 about	\$52.80 about
Marseilles.....	46.80 about	51.60 about
Barcelona <sup>2</sup> .....	25.20@26.40	25.20@26.40
South America		
Montevideo.....	22.80@24.00	22.80@24.00
Buenos Aires.....	22.80@24.00	22.80@24.00
Rosario.....	24.00@26.40	24.00@26.40
Rio Janeiro.....	18.00 about	19.00 about
Santos.....	19.50 about	20.00 about
Chile (good port).....	13.00@14.00	13.00@14.00
West Indies		
Havana.....	4.25@4.50	4.50 about
Cardenas, Sagua.....	6.50 about	6.50 about
Cienfuegos.....	7.00 about	6.75 about
Port au Spain.....	9.50@10.00	10.00 about
St. Lucia.....	9.50@10.00	10.00 about
St. Thomas.....	8.00@8.50	8.00@8.50
Barbados.....	9.50@10.00	10.00 about
Kingston.....	7.50 about	7.00@7.50
Curacao <sup>1</sup> .....	8.00@8.50	8.00@8.50
Santiago.....	7.00 about	6.75 about
Guantanamo.....	7.00 about	6.75 about
Bermuda.....	6.00 about	6.00 about
Mexico		
Vera Cruz.....	9.00 about	8.50@9.00
Tampico.....	9.00 about	8.50@9.00

<sup>1</sup> Spanish dues for account of cargo. <sup>2</sup> And c.e.

<sup>3</sup> Or other good Spanish port. <sup>4</sup> Net.

Note—Charters for Italy, France and Spain read "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

#### COASTWISE FREIGHTS

Three dollars and twenty-five cents has been paid a sailing vessel of 4000 tons or so, Hampton Roads to Portland, and that is today a fair index of the freight market. Charters are very rare, the bulk of New England receipts arriving in steamers on the old contract basis. No rates are reported on steamers over an extended period; that is, not in the open market. There is no eagerness on the part of shipowners to charter.

For New York loading to points on Long Island Sound barges are still being taken at \$1 in cases where good loading is assured. The congestion at some of the piers is such that boats are accepted only sparingly.

## Ohio Valley

#### PITTSBURGH

Severe cold snap. Spot market up nearly \$1; contracts being made rather slowly.

By far the severest cold snap of the season struck western Pennsylvania Sunday evening, temperatures dropping to below zero, and there was considerable snow. Railroad traffic was greatly impeded, but some empties had already been placed against Monday's loading. Late last week the spot market had softened somewhat, on account of the replacement of the Pennsylvania's embargo against the Youngstown district, Wednesday night but this week the market advanced enough to make up the loss and 25¢@50c. In addition, as compared with prices quoted in this report one week ago. Shipments are expected to be very poor this week as a whole, with very light supplies of cars the remainder of the week. Coal is likely to accumulate en route, making conditions more serious at distributing centers and consuming points than at the mines.

Contracting for the twelvemonth beginning Apr. 1 is proceeding more slowly than was expected by some of the operators. Buyers are decidedly adverse, as a rule, to contracting so far ahead, practically 14 months, at more than double prices. Most dealers are advising customers along this same line. The announcement of the Berwind-White Co. of a contract price of \$3.50 per gross ton f.o.b. its mines for the twelvemonth, contracts to be made for 50% as much tonnage as a year ago, is regarded as representing a price closely in harmony with the \$3 per net ton price already mentioned in these reports as the basis for renewing some contracts for Pittsburgh coal. This price is still open to old customers of certain Pittsburgh operators, who have not been taking advantage of the privilege very rapidly, but it does not seem to be quoted generally to new trade. Several contracts for byproduct coal have been made at \$3.15, but these were for the twelvemonth beginning Jan. 1 and according to the common analysis that is cheaper than coal at \$3 for the twelvemonth beginning Apr. 1. No success has attended the effort to make further contracts for ¼-in. gas coal at \$3.50, the price being regarded by consumers as too high.

We quote contract coal at \$3@3.25 for steam and \$2.25@2.50 for gas and spot coal at about \$4.75 for slack, \$5 for steam mine-run and \$5.50 for 3-in. gas, all per net ton at mine, Pittsburgh district.

#### BUFFALO

Car shortage delays movement. Record breaking blizzard. Shortage in Canada acute.

Bituminous—The trade is quite as much hampered by car shortage as ever, but the mining districts are not agreed as to prices. The Clearfield and Reynoldsville districts appear to have been hit harder than Pittsburgh by the new export complications and prices have declined quite a little in a short time, but Pittsburgh is holding up steady as before and may be able to maintain present figures. This market is not buying as much Panhandle and No. 8 coal as it was last fall and may conclude to stick to Allegheny Valley more closely. These other coals came in with a rush last year and at one time threatened to lead in this market and eastward, but they are not conspicuous now. Clearfield does not ship here, on account of a high freight, but its prices often affect this market.

There is no promise of immediate improvement in the car situation and this section has had one of the worst blizzards in its history. The Canadian roads are as nearly out of business as they ever were. The roads on this side are doing what they can to get coal started beyond the Niagara, but the situation is about as bad as it could be.

Bituminous prices are about as unsteady as ever. Jobbers here are seldom able to keep a very uniform price, as it depends much on the needs of the consumer, who will seldom pay the asking price until compelled to. Quotations are per net ton, f.o.b. Buffalo as follows:

Youghiogheny Gas.....	\$6.00@6.50
Pittsburgh Steam.....	5.75@6.25
Ohio No. 8.....	5.75@6.25
Allegheny Valley.....	5.50@6.00
Pennsylvania Smokeless.....	5.35@5.85
Cambria Co. Smithing.....	5.40@5.90
All slack.....	5.60@6.10
Cannel.....	5.90@6.40

Anthracite—The situation is without material change. So far as the trade passing through here is concerned it all depends on the car supply. Buffalo has coal enough, so the effort is all directed in getting a supply to certain towns further on, especially Canada. Retail dealers from that territory fairly haunt the shipping offices here, some of them being here almost every week.

There is no talk of change of price. All variation is in the independent coal that is coming this way. If it can be supplied in quantity promptly it commands a premium of \$2 or more westward, but Buffalo will not pay this nor will any other district if it has to be waited for in the usual way. It will no doubt be April now before the tension is off. The shippers will be quite as pleased as anyone to see the demand fall off. Deep snow, high wind and zero weather interfere much with the deliveries to houses.

#### TORONTO, CAN.

Coal situation very serious. Both hard and soft coal scarcer. Manufacturers may have to close down. Prices high and unsettled.

The coal situation has this week gone from bad to worse. The shortage of bituminous together with very severe weather has greatly increased the demand for anthracite and supplies for domestic purposes are running short. Soft coal is very scarce and manufacturers are being supplied from hand to mouth and liable to close down at any time. It is with difficulty that enough coal can be supplied to keep public institutions heated. Many dealers, manufacturing firms and public bodies have sent agents to Buffalo to locate the cars containing their consignments and endeavor to get them moved. Prices are so high and fluctuating so rapidly that any quotations would be misleading.

#### DETROIT

Further improvement in coal supply results from restoration of embargo on other freight. Vessel men maintain carrying contracts taken do not fix season coal rate on Lakes.

Bituminous—No date is yet announced for lifting the embargo against freight shipments other than coal or food supplies, which was again placed against the Toledo gateway, after having been removed for 48 hr. Meantime railroads entering Detroit have made considerable progress in clearing the tracks of freight, though 12,000 loaded cars are still reported on terminal tracks. In consequence of the freer movement of coal, there has been a slight easing of the strain, though the supply is not sufficient to create any reserve. The amount of slack arriving is not great enough to meet requirements and, some of the steam coal users still find it necessary to take larger sizes, including lump. Prices are holding rather steady at around \$5.25 to 5.50 at the mines for any size of coal. Near zero temperature continuing through several days has brought a more active inquiry for domestic stock.

Anthracite—While not plentiful, anthracite appears to be arriving in sufficient volume to

enable dealers to supply their customers. Prices in some of the retail yards have advanced as high as \$12.

Lake Trade—The fact that two or three coal shippers have been able to contract for vessel capacity at a carrying rate of 45c. to ports on Lake Superior and 50c. to some of the Lake Michigan docks, does not settle the season rate at those amounts. A large shipper who has been offering 50c. on coal to Lake Michigan has been unable to get tonnage at that price. Contracts have been taken by several vesselmen subject to the figure which may be fixed on as the season's going rate.

#### TOLEDO

Cold weather precipitates a serious situation. Shippers making desperate efforts to force coal through. Little contracting.

The conditions, which were serious enough during the period of soft weather, have become much worse. There is a shortage of domestic coal and people are making desperate efforts to secure supplies. Railroad yards are all congested and this extends to the northern terminals, where to make conditions still worse, car ferries have been disabled by accidents. There are embargoes on all Michigan roads and Detroit is suffering much worse than Toledo. The big producers are making desperate efforts to force their coal through to destination. The Toledo Railways and Light Co., while paying big premiums, has thus far been able to secure sufficient supplies.

It is rumored that some contracts have been taken at prices ranging from \$3 to \$4 on steam coal, but owing to the extreme shortage most Toledo firms declare that they will not take contracts at any price because they are by no means certain that they will be able to secure the coal. There are many inquiries and manufacturing institutions are especially eager to secure contracts.

#### COLUMBUS

The cold snap tightens up the market. Dealers are short of stocks and prices remain high. Railroads confiscating coal.

The cold wave with temperatures below zero caused more complications. Railroads, which were already in bad shape were still further hampered in the movement of coal. Additional demand from consumers coupled with low receipts have reduced dealers' stocks to a minimum and a famine is in prospect.

Dealers are apportioning available supplies among customers, only giving each a small amount. Retail prices are strong at former levels and indications are for still higher quotations. Anthracite is scarce and prices rule high. Shipments from West Virginia are considerably curtailed by railroad congestion.

In the steam trade conditions are also tense. Manufacturing plants have only a small tonnage on hand and some are compelled to operate with a day to day supply. Railroads are confiscating many cargoes to keep their trains moving and public service corporations are also in bad way. Contracting is not active as both the buyer and seller is inclined to go slow and only a few contracts are expiring at this time.

Lack of cars has curtailed the output in Pomeroy Bend, Cambridge, Crooksville and Massillon to about 50% normal. With a better car supply on the Hocking Valley Ry., the output there is about 70%.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump.....	\$4.75	\$5.00	
Inch and a quarter.....	4.75	5.00	\$5.00
Three-quarter inch.....	4.75	5.00	5.00
Nut.....	4.50	5.00	4.75
Egg.....	4.50	4.75	
Mine run.....	4.50	4.50	4.75
Nut, pea and slack.....	4.50	4.50	4.75
Coarse slack.....	4.50	4.50	4.75

#### CINCINNATI

Extremely cold weather and limited car supply have created a serious situation. Severe shortage is regarded as possible.

The coldest weather of the winter has resulted in the usual rush for emergency coal with little coal available, as the car situation is now at its worst. Operators in some cases have no cars at all, and the movement of trains has been hampered by the severe weather, and heavy snows. The low temperatures have made river navigation impossible, shutting off the supply from that source.

So far there is no actual shortage here but unless there is a radical change an acute shortage is by no means improbable. Steam prices are strong, with a rising tendency, around \$4 per short ton f.o.b. mines for both mine-run and nut and slack of the better bituminous grades, while smokeless quotations are hardly available, and only nominal, because of the virtual absence of free coal of this variety.

There are numerous inquiries regarding contracts, but operators are not inclined to be hasty about committing themselves. The market is at present in their hands, and such quotations as are available indicate that prices will range from \$2.50 to \$3.50 per ton f.o.b. mine. Some consumers state they will shut down their plants rather than pay such prices. It is not expected that many contracts will be closed before the latter part of March.

#### LOUISVILLE

Cold weather has again stimulated spot coal market and emergency calls increase. Car shortage only slightly improved.

Return of severe cold weather has again greatly stimulated the demand for coal for immediate delivery and spot coal of all kinds is at a premium. Some improvement in the car supply is reported. There is a good deal of talk to the effect that the Southern railroads will pay the mines a largely advanced price for coal during the coming year.

Prices in Eastern Kentucky range \$4@4.25 for block; \$3.75 for mine-run and around \$4.25 for spot nut and slack, all f.o.b. the mines.

There are no prices being made as yet in this market on contracts for steam coals, although there is much discussion as to probable prices. A large proportion of contracts handled through this market date from Apr. 1, many of them being for the Lake trade. Buyers are asking for prices and sometimes making offers. It is said that indications now are that a price of \$2.50 might rule about the first of April, although it is preferred to wait until that time approaches before business is booked. The same things relate to the year-round steam and gas coals.

#### BIRMINGHAM

Spot steam coal market stronger than at any time since the holidays. Consumers slow to negotiate contracts, taking chances on a recession later. Prices remain firm.

The local market is enjoying the healthiest spot trade on steam coal it has experienced since the holidays. Neither consumers or producers are anxious to enter into contracts, the former hoping for a drop later on, while the latter see a strong spot market amply able to take of the present restricted supply of free coal and with no indications of a change in the near future. It is understood that Tennessee and Kentucky producers are shipping the bulk of their tonnage north, which probably accounts in part for the increased inquiries in this field.

A contract for railroad fuel was closed recently at an advance of 45c. per ton over the previous price, calling for a fair tonnage for delivery over twelve months. Spot prices on steam grades are about as follows: Big Seam mine-run, \$2.50; Carbon Hill, \$2.75; Cahaba, Pratt and Black Creek, \$3 per net ton mines. Despite the fact that intensely cold weather has prevailed for several days the domestic market continues dull and retailers seem to be waiting to exhaust their present stocks before replenishing their supply. Domestic mines have diverted a large percentage of their output to steam channels. Lump coal is quoted at from \$3 to \$4 per net ton mines.

In several instances mines have lost from one to two days per week recently on account of car shortage. This was particularly true with the Frisco Lines, while the L. & N. has also been hard pressed.

#### Coke

#### CONNELLSVILLE

Severe cold snap promises large curtailment in production and shipments. Spot prices higher.

By reason of the severest cold snap of the season coming over the coke region Sunday evening, with temperatures below zero, the week opened with only a moderate car supply and with prospects that supplies would be worse and worse as the week progressed. The blast furnaces will simply have to cut the cloth accordingly as bidding up the market would not produce more coke and its movement would be slow in any event. Off grade coke for spot shipment sold at \$8 while one lot of 30 cars of standard sold at \$10, the top price reported for furnace. Spot foundry was up about 50c.

On account of lighter shipments as well as delays in transit supplies of coke at blast furnaces are likely to be nearer 50 per cent. of requirements than the 80 per cent. mentioned a week ago as representing the average at that time.

Now and then there is a little tentative enquiry as to furnace coke on contract but there are scarcely any active negotiations. We quote: Spot furnace, \$9.50@10; contract, \$8@8.50; spot foundry, \$10.50@11; contract, \$8@8.50, per net ton at ovens.

The "Courier" reports production in the Connelville and lower Connelville region in the week ended Jan. 27, at 352,401 tons, an increase of 4911 tons, and shipments at 335,317 tons, a decrease of 11,506 tons.

Buffalo—The situation is quite as tense as ever. The ovens appear to be sold up to capacity and can therefore ask the limit prices. The consumers are in no position to dictate and they will not be making prices till either the demand for iron and steel drops off materially or the byproduct ovens building at various points are in operation. Jobbers quote as formerly, \$11.85 for Connelville foundry, \$10.85 for furnace and \$9.85 for lower grades.

Chicago—Spot sales of coke are few and far between, with market prices practically unchanged. Spot sales are quoted on a basis of \$11 to \$13. Efforts made to increase production of byproduct sizes are offset by shortage of cars.



**St. Louis**—Local contracts on byproduct coke are being taken care of in full. The contract price on this is \$5.50 and on the gas house coke \$5. There is very little open market byproduct. One recent sale was for 5000 tons run-of-oven byproduct to a smelting plant in the West at \$10 per ton ovens with a rate of \$9.50 for immediate shipment. Recent offers from Chicago go as high as \$10 on domestic sizes, which were not accepted.

**Birmingham**—Spot foundry coke has climbed to \$12 per net ton ovens. This figure is also asked for new contract business in view of the fact that the spot demand is so strong and the amount of free coke so limited as to be inadequate to meet the needs of the trade. It is understood that the producers in the Virginia and West Virginia fields are finding it more profitable to manufacture 48-hr. furnace coke, for which they are receiving around \$7.50 per net ton ovens, and foundrymen formerly securing their supply from those districts are now seeking their requirements in this field. Local producers, however, announce a willingness to renew contracts with their old customers at \$10 per net ton ovens. There is no free furnace coke available above the contract requirements, and the district furnace consumption. Unfavorable weather conditions since the holidays have seriously affected labor efficiency and reduced the normal output of the ovens in the district.

## Middle Western

### GENERAL REVIEW

**Zero weather hardens coal situation. Car shortage becomes worse. Steam coals inclined to ease.**

While the spot steam market showed a tendency to become easier towards the close of last week it was again evident that very little surplus tonnage was on hand and needs were increasing everywhere due to the sudden appearance of the coldest weather of the winter over the week end. The terminal congestion has again become acute owing to extreme low temperatures.

Some buyers towards the close of the month were inclined to discontinue purchases, and there are rumors that large steam buyers have been endeavoring to make new contracts much below current market prices. It is said that dock supplies will be exhausted in another ten days, and this is causing nervousness in the Northwest. Heavy snow storms and extreme cold weather rendering railroad operations difficult, has caused a precarious situation at many consuming points in that territory. The heaviest movement of coal from Illinois mines into Northwestern territory is occurring at this time. January has been a month of heavy shipments from the head of the lakes, and it is said that the December record of about 1,200,000 tons will very nearly be equalled.

Bids of 35c., a 5c. increase over initial rates in 1916, from Buffalo to Duluth and Superior for carrying coal, have brought no response, and Lake carriers are evidently holding out for much higher figures. It is not expected that any large amount of soft coal will be available for Lake movement until June, and perhaps later, so it will be necessary to draw supplies from the Illinois and Indiana mines via all-rail during the spring months.

Increased car shortage is only one feature of the transportation difficulties, insufficient motive power also causing a very slow movement. Towards the close of last week many Western railroads were so short of coal that they were obliged to annul passenger trains, and were confiscating commercial shipments right and left in order to maintain freight traffic. Arrivals of Eastern and Southern coals have increased slightly.

A contract has been closed by some of the Franklin County operators for 60,000 tons of 2-in. screenings for the new Egyptian and Peninsular Cement Co. in Michigan. This is new contract business entirely for southern Illinois mines, since steam coals have never been shipped from that territory in previous years under contract to Michigan consumers. Southern Illinois mines have also closed a contract for 10,000 tons of 2-in. screenings at \$1.60 per ton to be shipped to the southern Wisconsin plants of the Carnation Products Co. It is claimed by some that offerers of contract coal at below the prevailing spot market has had a tendency to soften the latter.

### CHICAGO

**Easing of prices overcome by advent of zero weather. Screenings a trifle softer. Eastern coals strong. Anthracite shortage increases.**

Franklin County mines produced in January 1,110,000 tons, which is very near the high-water mark. The mines have received more orders this week than they could fill. Production has averaged about 75% of capacity. Williamson and Franklin County mines have been working steadily although the car supply has been insufficient. Screenings which had declined 25c. per ton during the early part of last week gained renewed strength at the end, and ranged from \$3.25 to \$3.50 at the close. No free coal is

available from Saline County, all tonnage being shipped under contracts with car supply limited. Operators of the southern Illinois mines are looking forward to a strong demand from Northwestern territory during the spring owing to shortage of Lake coal.

Trade in the central Illinois field has been active, with prices steady. Spot steam shipments which were softer early in the week regained their strength towards the end, screenings selling around \$2.50 to \$3. The mines in the Peoria district and northern Illinois field have been unable to meet all orders placed, and what little free domestic lump has been sold has brought \$4 per ton.

Wholesale prices of Indiana coal have been slightly lower, mine-run selling at around \$3, with domestic sizes ranging from \$3.25 to \$3.50. Screenings were below the \$3 mark for the first time in several weeks. The car supply at Indiana mines became much worse towards the end of the week, with prices showing an upward tendency.

The local spot market for smokeless coals is about the same as a week ago. The lifting of railroad embargoes against west-bound movement permitted a slightly increased tonnage to reach Chicago. Mine-run was sold as high as \$5, and lump and egg on about the same basis. Shipments going to the country districts were 25c. to 50c. higher. Contract business is being taken on a basis of \$3 for mine-run and \$3.75 for lump and egg. Free coal from the Pennsylvania districts continues very light.

No spot Hocking shipments have been available in this market this week. A few splint shipments have been sold at \$4.75. Kentucky coals are strong with shipments light, some few sales being made at \$4.50 to \$5 for domestic lump and egg.

The anthracite situation shows no betterment. Shipments made in November for all-rail movement to Chicago have not yet arrived. A large majority of retail yards in Chicago are bare of anthracite stocks. Prices remain at about the same level as last week. The shortage is most acute in chestnut, while pea and buckwheat are extremely scarce. Efforts by retailers to substitute smokeless, coke and Western bituminous coals for anthracite are not meeting with success.

## General Statistics

### CHESAPEAKE AND OHIO

The following is a comparative statement of coal traffic from the New River, Kanawha, and Kentucky districts for December, 1916, and calendar year:

To	December		12 Months	
	1915	1916	1915	1916
Tidewater.....	356,483	470,367	4,606,686	5,367,468
East.....	285,478	287,627	2,381,708	2,716,772
West.....	1,264,723	1,049,591	14,241,558	16,157,778
Company fuel.....	220,677	203,025	2,057,177	2,308,884
From connections.....	183,968	173,898	1,749,494	2,489,365
Total.....	2,311,329	2,184,508	25,036,623	29,040,267
Anthracite.....	1,489	1,553	15,843	16,579
Total.....	2,312,818	2,186,061	25,052,466	29,056,846

### NEW YORK STATE CANALS

That less coal is being carried on the State Canals each year is shown by the following tabulation:

	1913	1914	1915	1916
Anthracite.....	258,039	234,823	227,089	163,647
Bituminous.....	136,899	117,971	92,240	49,747

Classes and Railroads	November		11 Months	
	1915	1916	1915	1916
Anthracite:				
Baltimore & Ohio.....	139,416	192,035	1,209,807	1,517,755
Buffalo, Rochester & Pittsburgh.....	14,170	14,597	139,837	147,818
Buffalo & Susquehanna.....	1,282	1,004	7,105	6,525
Chesapeake & Ohio.....	1,122	1,493	14,354	15,026
Erie.....	914,850	797,063	8,592,333	8,727,707
Huntingdon & Broad Top Mountain.....	101	39	551	843
Pennsylvania.....	1,194,794	1,048,292	9,874,133	11,048,858
Pittsburgh & Lake Erie.....	241	40	815	761
Pittsburgh, Shawmut & Northern.....	1,619	1,012	9,963	10,553
Virginian.....	191	307	1,835	3,274
Western Maryland.....	35,213	56,656	314,457	42,998
Total.....	2,302,999	2,112,538	20,165,190	21,661,118
Bituminous:				
Baltimore & Ohio.....	3,016,640	2,837,429	30,504,179	32,888,412
Buffalo, Rochester & Pittsburgh.....	861,540	772,843	7,043,013	8,066,066
Buffalo & Susquehanna.....	150,899	128,670	1,014,221	1,365,844
Chesapeake & Ohio.....	2,141,243	2,136,377	20,888,794	24,749,900
Erie.....	824,975	739,336	6,405,257	7,135,521
Huntingdon & Broad Top Mountain.....	126,609	102,917	960,142	1,064,650
New York Central (Buffalo and east).....	688,612	684,130	5,835,974	7,099,552
Norfolk & Western.....	2,433,977	2,501,183	24,490,220	28,368,995
Pennsylvania.....	4,307,041	3,842,275	40,215,984	44,388,716
Pittsburgh & Lake Erie.....	1,081,860	1,006,502	9,518,436	10,773,604
Pittsburgh, Shawmut & Northern.....	291,920	108,495	2,050,451	2,642,699
Virginian.....	332,635	512,273	3,588,159	5,070,950
Western Maryland.....	849,587	741,745	8,037,088	7,988,273
Total.....	17,107,538	16,114,175	160,551,918	182,661,182

### ST. LOUIS

**Car shortage the most severe of the season. Colder weather steadies up prices but demand exceedingly light. Freer movements of anthracite, smokeless and Arkansas. Market generally pretty.**

Last week the market went down to about as low as it has been for the past four or five months, but the coldest wave of the winter at the beginning of this week stimulated conditions somewhat, though not to the extent that was anticipated. In addition to the cold weather the car shortage was the most severe of the season thus far. In spite of these conditions prices have not gone up as the demand is not sufficient to justify high prices. There has been some call from Chicago and the North for coal the past week, but the tonnage is light compared with what it has been.

In the Williamson-Franklin County field the mines have been working on about a 25 to 30 per cent. capacity on account of no cars. The operators in this field have just had about enough orders to keep going at this ratio, so that if cars were plentiful the market would be considerably lower.

On the first of the month Standard coal jumped from about \$2.10 to \$2.60 for 2-in. lump, but the demand for this grade is easing up. Steam sizes from the Standard field are in good demand, but even that does not keep the price regular.

Anthracite moved in fairly good the past week and there was a good volume of smokeless. The best tonnage of Arkansas this season thus far came in during the week, both anthracite and semianthracite.

There is every indication that with milder weather there will be an easier market unless equipment conditions continue as they are or more severe.

Country prices are about 25c. to 50c. higher than the St. Louis market, which is f.o.b. mines, per net ton:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump.....	\$2.75@3.00	\$2.75@3.00	\$2.50@2.75
3x6-in. egg.....	2.75@3.00	2.75@3.00	2.50@2.75
2x3-in. nut.....	2.75@3.00	2.75@3.00	2.25@2.50
No. 2 nut.....	2.75@3.00	.....	2.25@2.50
No. 3 nut.....	2.75@3.00	.....	2.25
No. 4 nut.....	2.75	.....	2.25
No. 5 nut.....	2.50	.....	2.00
2-in. screen.....	2.50	2.35@2.50	2.25
2-in. lump.....	.....	.....	2.25@2.50
3-in. lump.....	.....	.....	2.25@2.50
Steam egg.....	.....	.....	2.25@2.50
Mine run.....	2.75@3.00	2.25@2.50	2.00@2.25

Washed

No. 1.....	3.25	3.25	.....
No. 2.....	3.00@3.25	2.75	.....
No. 3.....	3.00@3.25	2.75	.....
No. 4.....	2.75	2.75	.....
No. 5.....	2.50	2.25	.....

Rate on Williamson & Franklin Co. is 72½c. Other fields is 57½c.

### BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of October and December, 1916 and 1915:

	October		December	
	1916	1915	1916	1915
Coal.....	2,812,756	3,124,328	2,606,773	2,805,803
Coke.....	371,537	368,257	309,791	377,511
Total.....	3,184,293	3,492,585	2,916,564	3,183,314

### COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for November and 11 months of 1915-16 were as follows, in short tons: